New Jersey Department of Environmental Protection
Division of Water Quality
Bureau of Surface Water Permitting

FACT SHEET

Masterfile #: 962 **PI #:** 46318

This fact sheet sets forth the principle facts and the significant factual, legal, and policy considerations examined during preparation of the draft permit. This action has been prepared in accordance with the New Jersey Water Pollution Control Act and its implementing regulations at N.J.A.C. 7:14A-1 et seq. - The New Jersey Pollutant Discharge Elimination System.

PERMIT ACTION: Surface Water Renewal Permit Action

1 Overview of Draft Renewal Permit:

The permittee has applied for a New Jersey Pollutant Discharge Elimination System (NJPDES) Surface Water Renewal Permit Action through an application dated October 27, 1997 with subsequent submittals dated August 8, 2000, September 28, 2006, and June 18-19, 2012. Until such time as this renewal permit is finalized, the existing permit remains in full force and effect pursuant to N.J.A.C. 7:14A-2.8.

This draft permit renewal proposes to authorize the discharge of wastewater and stormwater to Morses Creek. This includes regulation of outfalls previously regulated as well as outfalls that are newly regulated. This draft permit renewal also incorporates the New Jersey Department of Environmental Protection's (hereafter "the Department") determination with respect to the permittee's request for a thermal variance from surface water quality standards (NJSWQS) for heat and temperature pursuant to Section 316(a) of the Federal Clean Water Act as well as a determination pursuant to Section 316(b) of the Clean Water Act.

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2 Name and Address of the Applicant:

Phillips 66 Company
1400 Park Avenue
Linden, NJ 07036

3 Name and Address of the Facility/Site:

Phillips 66 Company
1400 Park Avenue
Linden City, Union County

4 Discharge Location Information:

A copy of the appropriate section of a USGS quadrangle map indicating the location of the facility and discharge points is included towards the end of this Fact Sheet.

Outfall Designator: 001A Discharge at Morses Creek Dam No. 1

General Information		Watershed Information	
Receiving Water:	Arthur Kill	Downstream Confluences:	Arthur Kill
Via :	Dam Overflow	Receiving River Basin:	Passaic, Hackensack, NY Harbor Complex
Classification:	SE3	WMA (a):	07
Latitude:	40° 38' 03.3"	Watershed:	Elizabeth, Rahway, Woodbridge
Longitude:	74° 12' 20.8"	Subwatershed:	Morses Creek/Piles Creek
County:	Union	HUC 14 (b):	02030104030010
Municipality:	Linden	303(d) Listings:	TDS, PCBs, Total Phosphorus, Mercury (Fish), Dieldrin, Chlordane, PAHs, Dioxin, DDE, DDD, DDT, Fecal Coliform, Hexachlorobenzene, Heptachlor epoxide
Outfall Description			
Outfall Configuration:	Dam	Submerged Pipe Characteristics:	Not Applicable

Outfall Designator: 002A: Wastewater Treatment Plant

General Information		Watershed Information	
Receiving Water:	Morses Creek	Downstream Confluences:	Arthur Kill
Via :	Submerged Pipe	Receiving River Basin:	Passaic, Hackensack, NY Harbor Complex
Classification:	SE3	WMA (a):	07
Latitude:	40° 37' 45.3"	Watershed:	Elizabeth, Rahway, Woodbridge
Longitude:	74° 13' 31.4"	Subwatershed:	Morses Creek/Piles Creek
County:	Union	HUC 14 (b):	02030104030010
Municipality:	Linden	303(d) Listings:	TDS, PCBs, Total Phosphorus, Mercury (Fish), Dieldrin, Chlordane, PAHs, Dioxin, DDE, DDD, DDT, Fecal Coliform, Hexachlorobenzene, Heptachlor epoxide

Outfall Designator: 003A, 004A, 005A: NCCW Discharges

General Information		Watershed Information	
Receiving Water:	Morses Creek Between DSN 001A and DSN 002A	Downstream Confluences:	Arthur Kill
Via :	Pipe (003A) Ditch (004A, 005A)	Receiving River Basin:	Passaic, Hackensack, NY Harbor Complex
Classification:	SE3	WMA (a):	07
Latitude:	Below 40° 37' 45.3"	Watershed:	Elizabeth, Rahway, Woodbridge
Longitude:	Below 74° 13' 31.4"	Subwatershed:	Morses Creek/Piles Creek
County:	Union	HUC 14 (b):	02030104030010
Municipality:	Linden	303(d) Listings:	TDS, PCBs, Total Phosphorus, Mercury (Fish), Dieldrin, Chlordane, PAHs, Dioxin, DDE, DDD, DDT, Fecal Coliform, Hexachlorobenzene, Heptachlor epoxide

Footnotes:
(a) WMA = Watershed Management Area
(b) HUC 14 = 14 digit Hydrologic Unit Code

As noted in Section 3 above, subwatershed is impaired for TDS, PCBs, Total Phosphorus, Mercury (Fish), Dieldrin, Chlordane, PAHs, Dioxin, DDE, DDD, DDT, Fecal Coliform, Hexachlorobenzene, and Heptachlor epoxide. This permit requires the permittee to sample for the 209 PCB congeners and may require implementation of a PCB Pollutant Minimization Plan if determined necessary based on the sampling results at a later date. Total Phosphorus, TDS, and fecal coliform are not pollutants of concern at this facility. The remaining pollutants are required to be monitored as part of the WCR toxic pollutant monitoring requirements.

5 Facility Description:

The facility is classified as a major discharger by the Department in accordance with the United States Environmental Protection Agency (EPA) rating criteria. Based on available data, the facility's current estimated combined long-term average flow for DSN 001A is 159 million gallons per day (MGD) and is 9.01 MGD for DSN 002A. Three additional outfalls, DSN 003A, DSN 004A, and DSN 005A, are regulated for the first time in this renewal action. Operations at

the facility include petroleum refining (SIC 2911), manufacturing of lubricants (SIC 2992), site remediation activities, and the manufacture of industrial organic chemicals (SIC 2869).

Stormwater discharges from various outfalls are covered under the individual stormwater permit NJ0026671. If there are any questions regarding the NJPDES/DST permit, contact the Bureau of Nonpoint Pollution Control at (609) 633-7021.

Ground water discharges and in-ground tanks are covered under NJPDES permit number NJ0105104 and consist of process wastewater and stormwater from retention impoundments and in-ground tanks. If there are any questions regarding the NJPDES/DGW permit, contact the Bureau of Nonpoint Pollution Control at (609) 633-7021.

6 Description of Receiving Waters:

The facility has been in operation at its present location since 1909. Morses Creek, which is 1.7 miles long and 20 yards wide, flows directly through the facility. The facility maintains two dams on Morses Creek. Dam No. 1, the lower dam, is located 300 meters upstream of the confluence with the Arthur Kill. Dam No. 2, the upper dam, is located at the confluence of Peach Orchard Creek (Reservoir 1) with Morses Creek. Dam No. 2 is located in the western portion of the facility and is upstream of the bulk of the facility's processing areas. Dam No. 2 provides a boundary between Reservoir 1 and Morses Creek and therefore limits the natural freshwater flow from Reservoir 1 to Morses Creek. Morses Creek is classified as SE3 waters below Dam No. 2. Dam No. 1 is located downstream of the bulk of the facility's processing area and provides a downstream boundary of Morses Creek.

As Morses Creek flows downstream from Dam No. 2 there are several point source discharges directly into the creek via pipes as well as via drainage ditches. Significant ditches that flow into Morses Creek include Railroad Avenue Ditch and Poly Ditch. These ditches also have many point sources discharges directly going into them. The natural ebb tide flow is limited from the Arthur Kill into Morses Creek by Dam No. 1.

There are several schematics included at the end of the fact sheet to describe this layout.

7 Description of Wastewater Outfalls and On-Site Treatment:

The existing permit includes conditions for two primary wastewater outfalls, DSN 001A and DSN 002A. DSN 001A is an instream sampling point in Morses Creek before it flows into the Arthur Kill. Discharge components into Morses Creek upstream of the dam consist of non-contact cooling water, cooling tower blowdown, condensate, stormwater, steam trap condensate, firefighting equipment test waters, and treated wastewater that was discharged upstream at DSN 002A. DSN 002A is the discharge from the treatment plant and contains wastewater from the refinery process, the Infineum USA LP West Side Chemical Plant, analogous wastewater from other intra-state Phillips 66 facilities, and stormwater and groundwater from the site.

The treatment plant process consists of oil/water separation, neutralization, equalization, aerated activated sludge, clarification, and mixed media filtration. Sludge is thickened, and filter pressed before being managed at an approved residuals management site. The design capacity of the treatment plant is 15 MGD. A schematic of the facility's treatment is included near the end of the fact sheet.

Effluent Limitation Guidelines (ELGs) are applicable to this facility in accordance with 40 CFR 419.20 for Petroleum Refining (Subpart B: Cracking) and 40 CFR 414.90 for Organic, Chemical, Plastic, and Synthetic Fibers (OCPSF) (Subpart I: Direct Discharge Point Sources That Use End-of-Pipe Biological Treatment). ELGs are applicable to the discharge from the wastewater treatment plant. Detailed ELG calculations are included at the end of this fact sheet.

The facility has three additional outfalls (1 pipe, 2 ditches) that are being newly regulated in this permit. These outfalls are designated as Railroad Avenue Ditch, Dam #2 Condenser Sewer, and Poly Ditch. All three of these outfalls consist primarily of a continuous flow of non-contact cooling water, but also consist of some steam trap condensate and

firefighting equipment test water. These three outfalls will be monitored in this renewal permit and will be identified as DSN 003A for the #2 Condenser Sewer outfall, DSN 004A for the Poly Ditch outfall, and DSN 005A for the Railroad Avenue Ditch outfall. Note that the Dam #2 Condenser Sewer outfall (DSN 003A) also contains stormwater from the DuPont SARs facility (discussed below), which is regulated separately before being commingled with the non-contact cooling water discharged through DSN 003A.

Dupont has constructed two sulfuric acid regeneration (SAR) units on the permittee's property. A wastewater discharge from the SAR units is sent to Phillip 66's on-site wastewater treatment plant and the estimated discharge rate of the discharge is 0.08 MGD. The permittee believes that this wastestream has contributed no new contaminants and that any flow increases are nominal. The stormwater from the SAR units is permitted via DuPont's General Permit No. NJ0088315 but then discharges into Bayway's stormwater sewers that drain to Morses Creek via the Dam #2 Condenser Sewer.

8 Description of Site-Specific Permitting Considerations and Section 316(a) Determination:

A. Regulatory Background to Sampling Location of Regulated Outfalls and Studies Conducted to Address Toxics

On December 1, 1989 Exxon (the permittee at that time) filed a petition requesting reclassification of Morses Creek, challenging the legality of any other classification than TW-4, established in 1975 by then DEP Commissioner Bardin. The designated uses of TW-4 waters were industrial and any other reasonable use. Exxon had specifically requested that a portion of Morses Creek between Dam Number 2 and the confluence with the Arthur Kill be reclassified with the TW-4 designation. The Department issued a decision on December 3, 1990 denying Exxon's request and maintained that Morses Creek is an SE3 classification. The continued SE3 classification for this surface water of the state provides for secondary contact recreation, maintenance and migration of fish populations, migration of diadromous fish, maintenance of wildlife and any other reasonable uses. Phillips 66 notes that security laws enacted after the Department's 1990 decision make secondary contact recreation unattainable as a designated use in Morses Creek as long as the facility remains in operation, whether or not the creek is dammed.

The Department's permitting goal is to ultimately regulate facility discharges so as to support all of the above designated uses in Morses Creek. As such, the existing NJPDES permit issued in March 1993 required the permittee to identify all point sources to Morses Creek and to perform effluent characterization studies. The Department stated the following in the draft permit with respect to this issue:

> Upon receipt of the effluent characterizations in the future, the permit may be reopened to incorporate appropriate limitations so as to assure compliance with the New Jersey Surface Water Quality Standards and other applicable requirements.

Further, with respect to DSN 001A, the draft permit stated the following:

> Based on the decision to deny the reclassification, DSN 001A is no longer an appropriate monitoring point to regulate wastewater emanating from the facility; and since no data exists for the individual point source discharges to Morses Creek, the Department has required that the applicant identify all discharges to Morses Creek between the two Dams and perform a waste characterization study for each ....Although the limitations are being rolled over from the previous permit, the Department does not agree that the allocations, limitations and monitoring location are appropriate to control the discharge of pollutants from the facility.

As noted above, in order to prepare for a change in location for monitoring, the existing 1993 permit required identification and characterization of all significant point sources to Morses Creek or to tributaries (i.e. ditches) to Morses Creek. Specifically, this permit continued regulation at DSN 001 and 002 at the previous sampling locations but also required the permittee to perform an effluent characterization study for three of the most significant wastewater sources, namely DSN 003A, 004A and 005A, to see if Water Quality Based Effluent Limitations (WQBELs) were warranted. This data was submitted in a study entitled "Final Report – Effluent Characterization Study, Chronic Toxicity Characterization Study", dated April 1994 and in a supplemental submittal dated February 29, 2000. A summary of this toxics data is included in the next section. The presence of toxics is being addressed via this renewal permit action.

B. Regulatory Background for Thermal Issues

The existing permit contains an effluent limitation of 95 degrees Fahrenheit at DSN 001 in accordance with N.J.A.C. 7:9B-1.14(d)11.iv. The New Jersey Surface Water Quality Standards (NJSWQS) at N.J.A.C. 7:9B-1.5(c).8.ii state the following with respect to thermal alterations outside of heat dissipation areas for SE waters:

> No thermal deviations which would cause temperatures to deviate more than 2.2°C (4°F) from September through May, nor more than 0.82°C (4°F) from June through August, nor cause temperatures to exceed 29.4°C (85° F).

In addition, N.J.A.C. 7:9B-1.5(h)2.i(1). states the following with respect to heat dissipation areas for streams:

(i) Not more than one-quarter (1/4) of the cross section and/or volume of the water body at any time.

(ii) Not more than two-thirds (2/3) of the surface from shore to shore at any time; and

(iii) These limits may be exceeded by special permission, on a case-by-case basis, when a discharger can demonstrate that a larger heat dissipation area meets the tests for a waiver under Section 316 of the Federal Clean Water Act.

Section 316(a) of the Federal Clean Water Act states, in part:

> ....the Administrator (of if appropriate, the State) may impose an effluent limitation under such sections for such plant, with respect to the thermal component of such discharge (taking into account the interaction of such thermal component with other pollutants), that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on that body of water.

In sum, the Department can deviate from the above referenced thermal effluent criteria for point sources and the heat dissipation dimensions provided that the conditions of Section 316(a) of the Clean Water Act are met. In other words, a Section 316(a) determination would override the NJNJSWQS thermal criteria.

The permittee provided a study entitled "Intake and Thermal Discharge Studies" dated April 1995. Information included in this study with respect to the thermal issue is as follows:

C. Studies Conducted to Address Thermal Issues

- Alternatives to existing cooling water system operating processes, practices, and facilities which may have the potential to reduce impingement, entrainment, and/or thermal discharge.
- The age of the equipment and facilities involved with the permittee's cooling water system.
- Engineering specific aspects of each cooling water system's alternative, including impacts such as process changes, safety, product quality and reliability.
- The intake flow and discharge flow at each discharge and reductions in flows attainable with each cooling water alternative.
- The construction and operating costs of each cooling water system alternative.
- Non-water quality environmental impacts, including energy requirements, of each cooling water system alternative.

Thermal Discharge Mapping Study

For the purposes of the Section 316(a) Determination, the permittee considered the Arthur Kill as the receiving waterbody. Bayway summarizes the thermal discharge mapping study as follows:

- The Bayway thermal discharge, with excess temperatures above 1°C, has an effect only on the upper 2.5 meters of the 12 meter water column of the Arthur Kill.

- Bayway can meet thermal NJNJSWQS during the nine non-summer months of September through May, except for short duration tidal events in the warmer non-summer months. During the tidal stage "slack water before ebb tide", which occurs 1 to 2 hours per day, the spatial "2/3" criterion may be somewhat exceeded in the top 1 to 2 meters of the water column in the warmer months of September, October, or May.

- Bayway can meet the intent and purpose of the NJNJSWQS during the summer months of June, July and August. The 0.8°C excess temperature contour does extend entirely across the Arthur Kill during most tidal cycles but remains confined to the upper 2 to 3 meters of the water column, with the exception of the area that is very close to the mouth of Morses Creek, and is restricted to within the 25% criterion for the cross-section at all times.

- Bayway contends that the latest modeling and data gathering reaffirm the conclusions reached during the March 1980 modeling effort by Ichthyological Associates, Inc. That study concluded that the thermal discharge from Bayway Refinery will not jeopardize the maintenance or passage of the representative important species in the Arthur Kill, nor will the thermal discharge block the migration of anadromous fish or inhibit the localized movement of residential fish. The behavioral response and tolerance to thermal exposure by the representative important species indicates that these populations, and therefore the aquatic community as a whole, will not suffer adverse effects.

- Bayway requests a thermal variance from the NJNJSWQS under Section 316(a) of the Clean Water Act. This request considered the Arthur Kill to be the receiving water. As noted above, Bayway concludes that the thermal discharge from the facility assures the protection and propagation of a balanced indigenous population in the Arthur Kill.

Cooling System Alternatives Study

Bayway also submitted a Cooling System Alternatives Study which evaluated four indirect and seven direct cooling technologies to determine if economically feasible alternatives exist to reduce the heat load currently discharged with the once-through non-contact cooling water discharged by Bayway. Indirect cooling methods include passive cooling systems used to minimize the amount of heat rejected to the non-contact cooling water and include the following four methods evaluated in this report: 1) waste heat recovery from process streams; 2) improved energy efficiency in refinery process units; 3) replacement of water cooled heat exchangers with air cooled heat exchangers; and 4) use of a tempered water system. Direct cooling technologies include cooling towers where seven different configurations were evaluated in this report.

The Cooling System Alternatives Study findings as contended by Bayway can be summarized as follows:

- The Department determined in the 1993 permit that the facility's once through cooling non-contact cooling water system was the Best Available Technology Economically Achievable (BATEA) for the control of thermal discharge.

- The refinery currently recovers waste heat from the process streams to the maximum extent practicable. Accordingly, enhanced heat recovery is not economically or technically viable as a means to appreciably reduce the heat load. The refinery's energy utilization is extremely efficient and has limited scope for improvement. The Bayway Refinery is a 2012 Energy Star Certified Facility.

- None of the four indirect cooling methods reviewed can economically reduce the heat load sufficiently to warrant implementation. The least costly option of the tempered water system ($4.4 million) achieves only a 2.4% heat

load reduction, or a heat load reduction cost of $183,000 per Mbtu/hr. The least costly air cooled replacement option ($15 million) achieves a 23.5% heat load reduction or a heat load reduction cost of $63,500 per Mbtu/hr. These quoted costs are estimated capitalized costs inclusive of basic equipment plus the present worth of annual operating costs; actual cost to install would be higher and incorporate related costs such as facility downtime and production losses.

- Construction of cooling towers could significantly reduce heat load and thermal discharges on a long term basis but only at costs ranging from $182,000 to $333,000 per Mbtu/hr. The least costly cooling tower alternative has an estimated total capitalized cost of about $166 million. Estimated to current costs, over $300 million would be required for the least costly alternative.

D. Department Determination

Based on the information described above for toxics and thermal issues, the Department has concluded the following:

- Even if the most expensive cooling tower technology was required, it is unlikely that the permittee could attain the NJNJSWQS for temperature at each of the point sources entering Morses Creek nor could it attain the NJNJSWQS at DSN 001. Factors affecting this thermal issue include the limited size of Morses Creek as well as the fact that the intake water coming from the Arthur Kill is in excess of the NJSWQS criteria under certain conditions.

- The permittee conducted a Section 316(a) study to request a thermal variance from the NJNJSWQS. This study considered the Arthur Kill to be the receiving water and concludes that the discharge from the facility assures the protection and propagation of a balanced indigenous population in the Arthur Kill. While the Department recognizes that Dam No. 1 limits flow from the Arthur Kill into Morses Creek, it is reasonable to conclude that this study could have included an evaluation of Morses Creek. This is based on the 1990 Department decision noted above which stated that Morses Creek is contaminated with oil, which seeps into the creek.

- The Department recognizes that Morses Creek is indeed a stream that shall be protected via the NJNJSWQS. However, the Department would be remiss if it did not recognize that the facility is involved with a large scale clean-up to improve the conditions of the facility including Morses Creek. The Department's Site Remediation Program is requiring significant measures to improve the quality of the receiving stream by reducing the loading of pollutants that enter the creek via groundwater. For example, sludge overlying the bed and groundwater flowing into Morses Creek is contaminated with oil, which seeps into the creek. While some benefits of the site remediation are already making an environmentally beneficial improvement on certain areas of the site, remediation of the stream bed is one of the last areas to be addressed. Therefore, the full benefits of that clean-up will not be realized for at least ten years.

- The toxics characterization showed that detectable quantities of toxics were indeed present at DSNs 003, 004 and/or 005. These quantities may be present due to the fact that they are present in the Arthur Kill intake water as shown in the 1994 toxics characterization. The Department could impose WQBELs for some of these toxics. Because dilution with Morses Creek is minimal, the Department would essentially be applying in-stream criteria at the end-of-pipe which would require significant treatment improvements. However, even if these treatment improvements were implemented and toxics were reduced to non-detectable levels, it would be pointless to require such as these wastestreams would be routed to Morses Creek where they would mingle with existing pollutants from historical sources. Imposing WQBELs based on improper data at this point would not result in protection of Morses Creek since pollutants will continue to find their way to the creek from other historical contamination in areas of the site that are not yet remediated.

- Morses Creek is dammed at both ends thereby limiting access to the balanced indigenous populations. Even if the dams were removed allowing access to aquatic life, it is unlikely that such a population could be supported in Morses Creek given its current degraded conditions.

Given the above, the Department has incorporated the following measures in this NJPDES permit renewal to address toxic and thermal pollutant contributions:

- Retention of comprehensive effluent limitations and monitoring requirements at DSN 001 (Dam 1) and DSN 002 (Wastewater Treatment Plant). This includes retention of the 95 degrees Fahrenheit effluent limitation for temperature as a daily maximum at DSN 001. Also carried forward are the Temperature Difference daily maximum limitation of 15 degrees Celsius and the Net Rate of Addition of Heat instantaneous maximum of 2,300 MBTU/Hr.

- Monitoring requirements for various conventional and toxic pollutants at the significant point sources and ditches that enter Morses Creek specifically DSN 003A, 004A, and 005A. This allows tracking of the thermal and toxic pollutant contributions and is consistent with the finding that Morses Creek is a stream.

9 Description of Cooling Water Intake Structure and Section 316(b) Determination

A. Regulatory Background – Section 316(a) and 316(b) of the Clean Water Act

Section 316(a) of the Federal Clean Water Act regulates the thermal component of surface water discharges. Specifically, Section 316(a) authorizes variances from thermal NJSWQS where it is shown that the alternative limit proposed will "assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife" in the receiving water. With respect to existing dischargers, 40 CFR 125.73(c) states the following:

(1) Existing discharges may base their demonstration upon the absence of prior appreciable harm in lieu of predictive studies. Any such demonstrations shall show:

(i) That no appreciable harm has resulted from the normal component of the discharge taking into account the interaction of such thermal component with other pollutants and the additive effect of other thermal sources to a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge has been made; or

(ii) That despite the occurrence of such previous harm, the desired alternative effluent limitations (or appropriate modifications thereof) will nevertheless assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is made.

(2) In determining whether or not prior appreciable harm has occurred, the Director shall consider the length of time in which the applicant has been discharging and the nature of the discharge.

Section 316(b) "require[s] that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The majority of environmental impacts associated with intake structures are caused by water withdrawals that ultimately result in aquatic organism losses. In that regard, cooling water intakes can have two types of effects. The first effect, referred to as *impingement*, occurs when organisms are caught on the intake screens or associated trash racks. Impingement can result in starvation and exhaustion, asphyxiation, and descaling as well as other physical harms. The second effect, referred to as *entrainment*, occurs when organisms pass through the facility's intake screens and the cooling system itself. Organisms that become entrained are normally relatively small benthic, planktonic, and nektonic organisms, including early life stages of fish and shellfish. As entrained organisms pass through a plant's cooling system they are subject to mechanical, thermal, and/or toxic stress.

EPA first promulgated regulations to implement section 316(b) in 1976. The U.S. Court of Appeals for the Fourth Circuit remanded these regulations to EPA which withdrew them, leaving in place a provision that directed permitting authorities to determine best technology available (BTA) for each facility on a case-by-case basis. In 1995, EPA entered into a consent decree establishing a schedule for taking final action on regulations to implement section 316(b).

Under that consent decree, Bayway would have been eligible under the Phase III rule. However, a brief background is provided for all aspects of the rulemaking effort to understand the current requirements.

EPA published a Phase I rule governing **new** facilities in 2001. The U.S. Court of Appeals for the Second Circuit, while generally upholding the rule, rejected the provisions allowing restoration to be used to meet the requirements of the rule. *Riverkeeper, Inc.* v. *U.S. EPA,* 358 F. 3d 174, 181 (2d Cir.2004) (''*Riverkeeper* I'').

EPA published a Phase II rule in 2004 that was applicable to **existing power plants with a design intake flow greater than or equal to 50 MGD**. Following challenge, the Second Circuit remanded numerous aspects of the rule to the Agency, including the Agency's decision to reject closed-cycle cooling as BTA. The Agency made this determination, in part, based on a consideration of costs and benefits. The Second Circuit concluded that a comparison of the costs and benefits of closed-cycle cooling was not a proper factor to consider in determining BTA. *Riverkeeper, Inc.* v. *U.S.EPA,* 475 F. 3d 83 (2d Cir. 2007) (''*Riverkeeper* II''). In 2008, the U.S, Supreme Court agreed to review the *Riverkeeper* II decision limited to the single cost-benefit issue. In April 2009, in *Entergy Corp.* v. *Riverkeeper Inc.,* 129 S. Ct. 1498, 68 ERC 1001 (2009) (40 ER 770, 4/3/09), the Supreme Court ruled that it is permissible under section 316(b) to consider costs and benefits in determining the BTA to minimize adverse environmental impacts. The court left it to EPA's discretion to decide whether and how to consider costs and benefits in 316(b) actions, including rulemaking and Best Professional Judgment (BPJ) determinations. The rule was remanded back to EPA for further review.

EPA published the Phase III Rule in 2006. The Phase III rule established 316(b) requirements for **certain new offshore oil and gas extraction facilities**. In addition, EPA determined that, in the case of **electric generators with a design intake flow of less than 50 MGD** and **existing manufacturing facilities**, 316(b) requirements should be established by NPDES permit directors on a case-by-case basis using their BPJ. In July 2010, the U. S. Court of Appeals for the Fifth Circuit issued a decision upholding EPA's rule for new offshore oil and gas extraction facilities. Further, the court granted the request of EPA and environmental petitioners in the case to remand the existing facility portion of the rule back to the Agency for further rulemaking.

In response to the remand in Phase II; the remand of the existing facility portion of the Phase III rule; and the associated Supreme Court decision; EPA proposed a rule in April, 2011. Most significantly, EPA proposed addressing existing power generating facilities and existing manufacturing and industrial facilities in one proceeding. Specifically, the 2011 proposal applies to all existing power generating facilities and existing manufacturing and industrial facilities that have a design intake flow of at least two million gallons from waters of the United States and use at least twenty-five (25) percent of the water they withdraw exclusively for cooling purposes. Bayway meets the eligibility criteria of this proposed rule.

While a finalized rule was due out by July 27, 2012, EPA secured an additional year to finalize the rule under a modified settlement agreement with the Riverkeeper. As per the settlement agreement, EPA is working to finalize the standards by June 27, 2013. Until such time as a final rule is issued, states are required to determine BTA for each facility on a case-by-case basis in accordance with BPJ.

B. Description of Cooling Water Intake Structure

Bayway uses a once-through cooling system. Two shoreline intake structures, designated as the North and South screenhouses are located east of the Bayway property where the North intake structure was built in 1941 and the South intake structure was built during the 1920s. The North and South screenhouses respectively, have four and five intake wells where each well is connected by a 3 foot pipe to a single pump onshore.

Two screenhouses have a total of nine circulators which withdraw water from the Arthur Kill. At the North Screenhouse, cooling water is withdrwawn from the Arthur Kill by one steam-driven 40,000 gallon per minute (gpm) and three synchronized electric 20,000 gpm pumps. The South Screenhouse has a compliment of three synchronized electric, one induction electric and one steam driven pump; each of the five pumps has a 20,000 gpm capacity. All pumps in both screen houses are single-speed pumps.

Water entering each intake bay is first strained by a steel bar trash rack with 2 inch by 4 inch openings that are approximately even with the front of the structure. Each of the intake bays is fitted with a vertical traveling screen recessed behind the trash rack. The screen panels have screen baskets where the screen material is PVC coated carbon steel with 0.375 inch wire mesh openings. The calculated velocity at 20,000 and 40,000 gpm pump capacities at low water are approximately 0.8 feet per second (fps) and 1.67 fps, respectively.

The traveling screens are typically rotated and washed for 20 minutes every 6 hours by an automatic timer. Material from the screens is washed into the single common sluiceway at the south intake structure and into the two sluiceways at the north intake structure, collected, and removed from the site. However, due to a screening structure in this sluiceway it is unlikely that any aquatic life survives.

According to a 2010 site-wide water balance, the facility uses 142 MGD (on average) of intake water from the Arthur Kill as a water source for its operations. In addition, the facility uses 3.5 MGD from Morses Creek and 3.3 MGD of utility water. Also, the facility uses the equivalent of 1.7 MGD of water in the form of steam purchased from the on-site Cogen Plant.

C. Studies Conducted to Evaluate Impingement and Entrainment and Intake Technologies

As noted previously, the permittee provided a study entitled "Intake and Thermal Discharge Studies" dated April 1995. Information included in this study with respect to impingement and entrainment issues is summarized below where impingement and entrainment data was collected from December 1993 through November 1994. A summary of the information is as follows:

- An estimate of the number of aquatic organisms lost annually due to impingement and due to entrainment. This estimate includes annual loss based on sampling of organisms present in the current intake, identified and quantified to the species level, or where identification was not possible to the species level to the lowest taxonomic level possible.

- Alternatives to existing cooling water system operating processes, practices, and facilities which may have the potential to reduce impingement, entrainment, and/or thermal discharge.

- The reduction in impingement and entrainment loss attainable with each cooling water system alternative.

The species selected for detailed analysis consist of one macroinvertebrate species and five fish species. The macroinvertebrate species is the blue crab (*Callinectes sapidus*). The fish species are bay anchovy (*Anchoa mitchilli*), Atlantic tomcod (*Microgadus tomcod*), blueback herring (*Alosa aestivalis*), naked goby (*Gobisoma bosci*), and winter flounder (*Pseudopleuronectest americana*). Each of these species was selected as an indicator of the potential effect of Bayway's cooling water intake because of one or more of the following characteristics: relatively high involvement with the intake, a range of sensitivity to entrainment and impingement representative of other members of the local biological community, importance to the food web or overall ecology of the Arthur Kill, importance to commercial or recreational fishery, threatened or endangered status or other particular concern of the regulatory agencies.

Entrainment Results

Entrainment sampling was performed one day (24 hours) per week during the principal entrainment period, namely late May-August 1994, and one day (24 hours) every other week during spring (March – mid-May) and fall (September – early November 1994). This period encompasses the annual entrainment season for most taxa inhabiting the Arthur Kill. The majority of the taxa collected (23) were marine and together they composed more than 99.6 percent of the organisms that were collected. The estuarine and diadromous taxa together composed approximately 0.01 percent of the catch.

An excerpt from Table 6-1 which shows the top species collected is as follows:

Taxa	Eggs	Yolk Sac Larvae	Post Yolk-Sac Larvae	Young-of-Year	Total	
	# Collected	# Collected	# Collected	# Collected	# Collected	% Composition
Bay anchovy	97,300	286	15,134	25	112,745	97.79
Winter flounder	0	165	474	32	671	0.58
Naked goby	0	0	445	2	447	0.39
Gobiidae spp.	0	0	427	0	427	0.37
Grubby	0	65	290	3	358	0.31
Northern pipefish	0	0	60	1	61	0.05
Weakfish	0	0	44	1	45	0.04
Menidia spp.	0	0	21	0	21	0.02
Total	**97,300**	**516**	**16,895**	**64**	**114,775**	**99.55**

As indicated from the above, the most abundant taxon in the entrainment collections was bay anchovy. This single species accounted for almost 98 percent of the organisms collected in entrainment sampling at Bayway. Bay anchovy were collected from late March through the end of sampling in early November. More than 86 percent of the bay anchovy collected were eggs; most of the remaining were post yolk-sac larvae (13.4 percent). The highest densities of bay anchovy eggs collected generally occurred during June and early July. Only a few anchovy juveniles or yolk-sac larvae were collected.

Impingement Results

Impingement sampling was performed throughout one full day (24 hours) per week during an impingement sampling program spanning 52 weeks. Twenty-nine species of fish and blue crab, comprising a total of only 395 organisms, were collected during this program. More than 72 percent of the total number of organisms collected were marine, with estuarine and diadromous taxa composing 17 percent and 7 percent of the total catch, respectively.

An excerpt from Table 6-3 which shows any species that comprise more than 1% of the total composition is as follows:

Taxa	Number of Young-of-Year	Number of Yearling and Older	Total Number	Percent Composition
Marine				
Blue crab	2	198	200	50.63
Smallmouth flounder	1	25	26	6.58
Winter flounder	12	1	13	3.29
Grubby	0	6	6	1.52
Atlantic silverside	0	5	5	1.27
Butterfish	2	3	5	1.27
Silver hake	1	3	4	1.01
Spotted hake	0	4	4	1.01
Cunner	0	4	4	1.01
Estuarine				
Threespine stickleback	0	49	49	12.41

White perch	2	16	18	4.56
Diadromous				
Striped bass	0	14	14	3.54
Rainbow smelt	0	8	8	2.03
Alewife	2	3	5	1.27
Freshwater				
Gizzard shad	0	11	11	2.78
Total	**22**	**350**	**372**	**94.18**

The collection of impinged organisms in this study are considerably lower than those reported from previous impingement mornitoring studies at Bayway conducted in 1975 – 1976 and in 1978. In weekly impingement monitoring for 24 hours conducted from May 1975 through April 1976, a total of 23, 795 fish were collected. Of these, 16,538 (almost 70 percent) were mummichog, with blueback herring, silver hake, and bay anchovy comprising another 25 percent of the collections. A total of 1,269 blue crabs were also collected.

Bayway contends that the reason for this apparent reduction in impingement between these two studies is not clear. While more than 16,000 mummichog, comprising 70 percent of the fish collections were collected in the 1975-1976 study, only one mummichog was collected in the current study. The mummichog is an extremely hardy fish and able to withstand low dissolved oxygen conditions which exclude other species. As a result, the mummichog may have become extremely abundant in the mid-1970s due to the lack of competition and predation. This dramatic reduction in mummichog abundance in this more recent sampling program may reflect improving water quality in the vicinity of Bayway which allowed competitors and predators to drive mummichog out of the main channel of the Arthur Kill and limit their distribution to tidal creeks and shallows resulting in a more balanced and diverse community as observed in the more recent sampling efforts.

Intake Technologies

As summarized in Table 8-1, Bayway evaluated the following intake technology/devices:

- Air curtain
- Electrical field/screen
- Hanging chain curtain
- Lights/strobes
- Hydroacoustic
- Fixed vertical screens
- Ristroph/Fletcher bucket traveling screens
- Cylindrical wedgewire screens
- Perforated pipe
- Rotary drum screens
- Barrier net
- Woven fine-mesh screens
- Dual flow screens
- Porous dike/leaky dam
- Angled vertical screens
- Inclined plane screens
- Louvers
- Multiple pump configuration/variable speed pumps

Bayway also presented an analysis of cooling system modifications including:

- Retrofit supplemental air coolers
- Tempered water system

- Once-through cooling system with a supplemental cooling tower
- Retrofit recirculating cooling system with a cooling tower

As presented in this 1995 report, cooling system modifications have a demonstrated ability to reduce intake-related mortality and have capital costs ranging from $11,449,000 for replacing 9 water coolers with air coolers with a reduction in flow to 131 MGD to $260,000,000 for retrofit with a recirculating cooling water system with a natural draft cooling tower. They have additional operating and maintenance costs ranging from $578,452 for the air cooler system to $9,387,000 for retrofit with a recirculating cooling water system with wet-dry cooling towers. The annualized capital and operation and maintenance costs based on a 10-year equipment life ranges from $2,078,900 for the 9 air coolers to $37,747,100 for the recirculating cooling water system with a natural draft cooling tower.

D. Section 316(b) Best Technology Available Determination

As noted previously, EPA is required to finalize Section 316(b) rules by June 27, 2013 (http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/). Since the EPA rule requirements are not yet known, states are required to issue Section 316(b) determinations in accordance with BPJ until such time as the new Section 316(b) regulations are finalized.

There are three components to the regulation proposed on April 20, 2011. First, most facilities would be subject to an upper limit on how many fish can be killed by the facility through impingement. The facility would determine which technology would be best suited to meet this limit, including whether to reduce its intake velocity to 0.5 feet per second. Facilities that withdraw at least 125 million gallons per day of intake water would be required to conduct studies to determine whether and what site-specific entrainment mortality controls, if any, would be required. Third, new units at an existing facility that are built to increase the generating capacity of the facility would be required to reduce the intake flow to a level similar to a closed cycle, recirculation system. While the third component would not apply to Bayway unless new units are built, the first and second components do apply. Specifically, Bayway utilizes an intake velocity in excess of 0.5 feet per second and withdraws approximately 142 MGD of intake water on average.

With respect to compliance dates in the proposed rule, EPA has stated that the compliance dates won't be relevant until EPA issues a final rule. When the final rule is effective, technologies to meet the impingement requirements of the rule would have to be implemented as soon as possible but within 8 years at the latest. Larger facilities have to perform some additional studies but that will be determined by their permitting authority.

The Department has repeatedly gone on record through its comments on EPA's rule making effort as well as through individual permit actions that Ristroph traveling screens (i.e. Unit 6/8) are a proven and effective technology to minimize impingement mortality. Constant rotation and screen washes serve to reduce impingement mortality by assisting organisms into the fish return system, which should discharge below the tide level. Modified Ristroph traveling screens are particularly effective in reducing impingement mortality for blue crab, a species which has one of the highest impingement rates at Bayway

While the Department recognizes the uncertainty associated with the proposed rule at this time, the Department would like to expedite compliance with the impingement mortality standard. As a result, the Department is requiring Bayway Refinery to submit an Impingement Alternatives Analysis for the Salt Water Pump Station within 15 months of the effective date of this renewal permit. The purpose of this study is for Bayway to evaluate and analyze a potential alternative for reducing impingement mortality at the Salt Water Pump Station with a focus on improved screens. The feasibility study shall address the following factors:

- Replacement of the existing screens with Ristroph screens having a dual spraywash system (high-and-low-pressure). The screens shall have fish lifting buckets to hold the fish in water as they are lifted to the low-pressure spraywash removal system. The screen size shall be optimized to minimize fish mortality and the screen mesh shall have a smooth face. These screens shall be operated continuously exclusive of periods of maintenance requirements.

- Installation of a fish return system for the intake structure that is designed and constructed in consideration of the following factors: 1) using a fiberglass composite or a similar non-abrasive material that will be added to the full length of the interior surface trough of the fish return; 2) material that will reduce abrasion and obstructions to fish; 3) sufficient capacity, flow volume and water level to facilitate safe return of impinged organisms to the Arthur Kill; and 4) the fish return conveyance terminus is designed to be submerged at all tidal stages on a year-round basis.

- Inclusion of scoping cost estimates for alternatives and a project implementation schedule.

The permittee shall submit the Impingement Alternatives Analysis on or before EDP + 15 months. The permittee shall submit these technical findings to the Department as indicated in Part IV. Upon receipt of this information, the Department will evaluate the findings in concert with the final EPA regulations and will reopen the permit to incorporate permit conditions pursuant to N.J.A.C. 7:14A-16.4.

In consideration of the regulatory and technical information available at this time, the Department hereby determines that conducting an Impingement Alternatives Analysis to assess the installation of modified Ristroph traveling screens as well as a fish return system to the Salt Water Pump Station constitutes BTA based on BPJ in accordance with Section 316(b) of the Clean Water Act.

10 Type and Quantity of the Wastes or Pollutants:

The Permit Summary Table near the end of this fact sheet contains a summary of the quantity and quality of pollutants treated and discharged from the facility and the proposed effluent limitations. Effluent data was obtained from the facility's Monitoring Report Forms for the time period specified in the table and the application submitted by the applicant. Data obtained from the "Final Report: Effluent Characterization Study, Chronic Characterization Study", dated August 11, 1994 for the three non-regulated discharges into Morses Creek can be found in the Permit Summary Table for those three outfalls.

11 Summary of Wastewater Outfall Permit Conditions:

The existing and proposed effluent limitations and other pertinent information regarding the draft permit are described below:

A. Basis for Effluent Limitations and Permit Conditions - General:

The effluent limitations and permit conditions in this permit have been developed to ensure compliance with the following:

1. NJPDES Regulations (N.J.A.C. 7:14A),
2. New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B),
3. New Jersey's 2010 Integrated Water Quality Monitoring and Assessment Report (integrated report),
4. Interstate Environmental Commission (N.J.A.C. 7:9B-1.5(b)2),
5. Existing permit limitations in accordance with N.J.A.C. 7:14A-13.19 and 40 CFR 122.44 (antibacksliding requirements),
6. Permit limitations in accordance with N.J.A.C. 7:9B-1.5(d) (antidegradation requirements),
7. Statewide Water Quality Management Planning Rules (N.J.A.C. 7:15),
8. Technology Based Treatment Requirements or Effluent Limitation Guidelines Requirements (N.J.A.C. 7:14A-13.2 to 13.4),
9. Sludge Quality Assurance Regulations (N.J.A.C. 7:14C),

Technology based limitations are authorized by Section 301 of the Clean Water Act, 40 CFR 122, N.J.S.A. 58:10A-4, and N.J.A.C. 7:14A-13.2(a)1.ii., 13.3(b), and 13.4. In general, effluent limitations are based on ELGs, developed by the EPA, or on case-by-case limitations developed through a BPJ analysis in cases where ELGs are not available or appropriate. ELGs are minimum technology based requirements applicable on a nation-wide basis and are published in 40 CFR Subchapter N. ELGs consider the category of industry that produce common pollutants taking into account the specific factors unique to a particular type of industry (manufacturing process, type and quantity of pollutants generated, types of treatment facilities available to treat the pollutants, etc.). In cases where ELGs are applicable for surface water dischargers, ELG loading limitations are calculated using the specified concentration value and the production information provided by the permittee. BPJ determinations are authorized by Section 402 (a)(1) of the Clean Water Act.

In accordance with N.J.A.C. 7:14A-13.5, WQBELs are imposed when it has been determined that the discharge of a pollutant causes an excursion of criteria specified in the NJSWQS, N.J.A.C. 7:9B-1.1 et seq., and the Federal Water Quality Standards, 40 CFR Part 131. WQBELs are authorized by Section 301 of the Clean Water Act, 40 CFR 122, N.J.S.A. 58:10A-4, and N.J.A.C. 7:14A-13.2 and 13.3. The policies used to develop WQBELs are contained in the State and Federal Standards. Specific procedures, methodologies, and equations are contained in the current USEPA "Technical Support Document for Water Quality-based Toxics Control" (TSD) (EPA- 505/2-90-001) and are referenced in N.J.A.C. 7:14A-13.5 and 13.6.

Expression of all effluent limitations is in accordance with N.J.A.C. 7:14A-13.14 and 13.15.

Whole effluent toxicity limitations are expressed as a minimum as a percent.

Loading limitations (kg/day) for non-ELG limitations for DSN 001A and DSN 002A were calculated by multiplying the long-term average flow value of 159 million gallons per day (MGD) and 9.01 MGD, respectively, by the conversion factor of 3.785 (L/gal) and the appropriate concentration limitation (µg/L).

B. Basis and Derivation for Effluent Limitations and Monitoring Requirements- Under Effluent Limitation Guidelines:

All permit limitations and conditions in this permit action, are equal to or more stringent than those contained in the existing permit action. As a result, this permit action satisfies the federal and state anti-degradation regulations at 40 CFR 131.12 and N.J.A.C. 7:9B-1.5(d), and no further anti-degradation analysis is necessary.

Monitoring frequencies and sample types are in accordance with N.J.A.C. 7:14A-14, unless specified otherwise in the permit. In accordance with N.J.A.C. 7:14A-14.2, the permittee may submit a written request for a modification of the permit to decrease monitoring frequencies for non-limited parameters listed in Part III if site specific conditions indicate the applicability of such a modification.

Except for certain parameters at DSN 002, discussed further below, that are based on the ELGs at 40 CFR 419.20 for Petroleum Refining (Subpart B: Cracking) and 40 CFR 414.90 for Organic, Chemical, Plastic, and Synthetic Fibers (OCPSF), this permit action does not authorize any increase in the concentration or loading of pollutants above those levels authorized under the existing permit. All other permit limitations and conditions in this permit action, are equal to or more stringent than those contained in the existing permit action. As a result, this permit action satisfies the federal and state anti-degradation regulations at 40 CFR 131.12 and N.J.A.C. 7:9B-1.5(d), and no further anti-degradation analysis is necessary.

Although the monthly average for Phenolic Compounds, Total and Hexavalent Chromium and some toxic pollutants regulated under the OCPSF ELGs are less stringent in this renewal, the vast majority of toxic pollutants are at non-detectable or insignificant levels in the effluent. Since this effluent undergoes treatment in a wastewater treatment plant prior to discharge and since the permittee is not proposing any changes in its treatment or operations, it is not anticipated that the actual levels of these pollutants in the discharge will increase because the loading limitations are slightly less stringent. Additionally, no WQBEL will be increased or removed as none are currently applicable at DSN 002.

In accordance with 40 CFR 122.44(l)(2)(i)(A), permit limitations based on ELGs can be adjusted to reflect an increase in production at the facility. This is due to the fact that this is considered to be one of the exceptions to the provisions of 40 CFR 122.44(l)2 regarding anti-backsliding which require limits imposed in a renewal permit to be at least as stringent as limits imposed in an existing permit.

Description of Applicability under the Effluent Limitation Guidelines for the Petroleum Refining Point Source Category:

The ELGs for the Petroleum Refining Point Source Category (40 CFR Part 419) classify refineries into five basic subcategories based on the types of products manufactured and the processes used at the facility. These subcategories and their descriptions of applicability include the following:

Subpart A - Topping Subcategory: - This subpart applies to discharges resulting from the manufacture of petroleum products by topping, catalytic reforming and any additional refinery processes other than thermal processes (coking, vis-breaking, etc.) or catalytic cracking.

Subpart B - Cracking Subcategory: - This subpart applies to discharges resulting from the manufacture of petroleum products by topping, cracking and any additional refinery processes other than the processes specified in Subparts C, D or E.

Subpart C - Petrochemical Subcategory: - This subpart applies to discharges resulting from the manufacture of petroleum products by topping, cracking, petrochemical operations and any additional refinery processes other than the processes specified in Subparts D or E. "Petrochemical operations" shall mean the production of second-generation petrochemicals (i.e. alcohols, ketones, cumene, styrene, etc.) or first generation petrochemicals and isomerization products (i.e. BTX, olefins, cyclohexane etc.) where 15 percent or more of refinery production are first-generation petrochemicals and isomerization products.

Subpart D - Lube Subcategory: - This subpart applies to discharges resulting from the manufacture of petroleum products by topping, cracking, and lube oil manufacturing processes operations and any additional refinery processes other than the processes specified in Subpart E.

Subpart E - Integrated Subcategory: - This subpart applies to discharges resulting from the manufacture of petroleum products by topping, cracking, petrochemical operations, lube oil manufacturing and any other refinery process.
The major refining processes (as itemized in Appendix A of 40 CFR Part 419) at Bayway include the following:

Atmospheric Crude Distillation
Vacuum Crude Distillation
Crude Desalting
Fluid Catalytic Cracking
Hydrocracking
Hydrotreating
Catalytic Reforming
H2SO4 Alkylation

The facility's wastewater is regulated under the ELGs of the Petroleum Refining Point Source Category, Subpart B-Cracking Subcategory. Best Available Technology (BAT) limitations are based on 40 CFR 419.23, and Best Conventional pollutant control Technology (BCT) limitations are based on 40 CFR 419.24. Where appropriate, those guidelines were used to develop effluent limitations for the discharge from this facility. ELGs are provided for the following parameters at the indicated treatment levels:

Pollutants	**Treatment Levels**					
	Wastewater		Contaminated Stormwater		Ballast Water	
BOD_5	BPT	**BCT**	BPT	**BCT**	BPT	**BCT**
Total Suspended Solids	BPT	**BCT**	BPT	**BCT**	BPT	**BCT**
Chemical Oxygen Demand	BPT	**BAT**	BPT	**BAT**	BPT	**BAT**
Oil and Grease	BPT	**BCT**	BPT	**BCT**	BPT	**BCT**
Ammonia-Nitrogen	BPT	**BAT**				
Sulfide	BPT	**BAT**				
Phenolic Compounds	BPT	**BAT**	BPT	**BAT**		
Total Chromium	BPT	**BAT**	BPT	**BAT**		

Hexavalent Chromium	BPT	**BAT**	BPT	**BAT**		
pH	BPT	**BCT**	BPT	**BCT**	BPT	**BCT**

BPT – Best Practicable control Technology currently available.
BAT – Best Available control Technology economically achievable.
BCT – Best Conventional pollutant control Technology.

For conventional pollutants (BOD_5, TSS, Oil and Grease, and pH), if both BPT and BCT ELGs are available, BCT is applied. Similarly, for non-conventional and toxic pollutants, if both BPT and BAT ELGs are available, BAT is applied. The applicable ELG is shown in **Bold** in the table above.

Production Based Loading Limitations:

The ELGs for the Petroleum Refining Point Source Category (40 CFR Part 419) contain production-based loading limitations for 5-Day Biochemical Oxygen Demand (BOD5), Chemical Oxygen Demand (COD) or Total Organic Carbon (TOC), Total Suspended Solids (TSS), Oil and Grease, Ammonia-Nitrogen, Total Recoverable Chromium, Hexavalent Chromium, Total Recoverable Phenolics and Total Sulfides. In the existing permit, these limitations were based on an average production rate of 250,000 bbl/day. Since the Department relies on a long-term average of production, mass-based loading limitations for this permit renewal have been calculated based on the current feedstock rate of 300,000 bbls/day.

Description of Applicability under the Effluent Limitation Guidelines for the Organic Chemicals Plastics Synthetic Fibers Category

Manufacturing under the SIC code 2869 is covered under the ELGs for Organic Chemicals, Plastics and Synthetic Fibers (OCPSF) manufacturers (40 CFR Part 414.91). The OCPSF ELGs applicable to this facility require the imposition of effluent limitations on the process wastewater component of the discharge for Specialty Organic Chemicals. This facility is also subject to limits representing BAT economically achievable as included in Subpart I-Direct discharge point sources that use end-of-pipe biological treatment for the toxics. Any discharge subject to this subpart must achieve discharge levels not exceeding the quantity (mass) determined by multiplying the process flow times the concentration values listed in the OCPSF ELG.

The Department has calculated all OCPSF mass limits using a flow value of 11.5 MGD, which is the flow from the OCPSF processes. The ELGs are then calculated by multiplying this flow value by the conversion factor of 3.785 (L/gal) and the appropriate concentration limitation (mg/L or ug/L).

In the event that any production increase results in a flow increase, the permittee can request a modification to its permit to evaluate an alternate flow value for the OCPSF based limits. Any such modification would be issued as a major modification consistent with N.J.A.C. 7:14A-16.4.

Metals limitations contained in 40 CFR Part 414 are applicable to some metal and cyanide generating operations provided such are performed at the facility. Since none of these operations are performed at the facility, the OCPSF metals limitations are not applicable to this facility at this time.

DSN 001A: Discharge from Dam No.1

1. Flow:

   This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13. Intake flow monitoring is being imposed to assess the withdrawal rates for the facility for the purpose of Section 316(b) of the Clean Water Act.

Monitoring for effluent shall be conducted on a **continuous** basis, while the sample type shall be **metered**. Monitoring for intake shall be conducted on a **continuous** basis at the Arthur Kill Pump Station, while the sample type shall be **calculated**.

2. Total Organic.Carbon (TOC) Net:

The loading limitation of 6,241 kg/day as a daily maximum is being carried forward from the existing permit in accordance with the N.J.A.C. 7:14A-13.19. The permittee shall also monitor for monthly average loading and the monthly average and daily maximum concentrations.

Phillips 66 is eligible for net limits for this parameter as it meets the criteria specified at 40 CFR 122.45 and N.J.A.C. 7:14A-13.4(k), which states that they are eligible since the intake water is drawn from the same body of water into which the effluent is discharged. Net limitations for TOC shall be calculated by using the following formula which is included as item A.1.m of Part IV.

[(gross effluent concentration)*(gross effluent flow) - (intake concentration)*(intake flow)] / [gross effluent flow].

Since this parameter is reported on a net basis consistent with the existing permit, the permittee shall report for the sample points of effluent gross and intake. Compliance with the sample point effluent net should be reported as the result of the effluent gross minus the intake.

The monitoring frequency of **three per week** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

3. Total Suspended Solids (TSS) Net:

The concentration limitations are based on the provisions at N.J.A.C 7:14A-13.19 and are consistent with the Interstate Environmental Commission Regulations. The limitations are a monthly average of 30 mg/L and a daily maximum 50 mg/L.

Phillips 66 is eligible for net limits for this parameter as it meets the criteria specified at 40 CFR 122.45 and N.J.A.C. 7:14A-13.4(k), which states that they are eligible since the intake water is drawn from the same body of water into which the effluent is discharged. Net limitations for TSS shall be calculated by using the following formula which is included as item A.1.m of Part IV.

[(gross effluent concentration)*(gross effluent flow) - (intake concentration)*(intake flow)] / [gross effluent flow].

Since this parameter is reported on a net basis consistent with the existing permit, the permittee shall report for the sample points of effluent gross and intake. Compliance with the sample point effluent net should be reported as the result of the effluent gross minus the intake.

The existing monitoring frequency of **once per week** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

4. Oil and Grease (O&G) Net:

The effluent concentration limitations are based on N.J.A.C. 7:14A-12.8(c) and are a monthly average of 10 mg/L and a daily maximum of 15 mg/L. The permittee shall meet the daily maximum loading limitation of 2,260 kg/day and monitor and report for monthly average loading, which is carried forward in accordance with N.J.A.C. 7:14A-13.19.

Phillips 66 is eligible for net limits for this parameter as it meets the criteria specified at 40 CFR 122.45 and N.J.A.C. 7:14A-13.4(k), which states that they are eligible since the intake water is drawn from the same body of water into which the effluent is discharged. Net limitations for O&G shall be calculated by using the following formula which is included as item A.1.m of Part IV.

[(gross effluent concentration)*(gross effluent flow) - (intake concentration)*(intake flow)] / [gross effluent flow].

Since this parameter is reported on a net basis consistent with the existing permit, the permittee shall report for the sample points of effluent gross and intake. Compliance with the sample point effluent net should be reported as the result of the effluent gross minus the intake.

The condition from the existing permit to allow the permittee to use the Petroleum Hydrocarbons test method for the O&G sample is being carried forward in this renewal action.

The existing **three per week** monitoring frequency is being carried forward from the existing permit. The sample type shall be **grab**.

5. pH:

The effluent limitations are based on the Effluent Limitation Guidelines and are carried forward from the existing permit consistent with N.J.A.C. 7:14A-13.19. The limitations are a minimum of 6.0 s.u. and maximum of 9.0 s.u.

The existing monitoring frequency of **once per week** is being carried forward from the existing permit. The sample type shall be **grab**.

6. Temperature and Heat:

The daily maximum limitation of 35 degrees Celsius is being carried forward in this renewal permit in accordance with N.J.A.C. 7:14A-13.19. The daily maximum limitation for "Temperature Difference" of 15 degrees Celsius and the daily maximum limitation of 2,300 MBTU/HR for "Net Rate Heat" are also being retained in the permit. Please refer to the Section 316(a) determination for additional information regarding temperature and heat.

The existing monitoring frequency of **continuous** for temperature is being carried forward from the existing permit. The sample type shall be **metered**. Heat load is calculated using the metered temperature. In accordance with the existing permit, all heat related parameters are reported on a 24-hour daily average basis.

7. Chlorine Produced Oxidants (CPO):

The instantaneous maximum of 0.20 mg/L is being carried forward from the existing permit and is in accordance with the ELGs for Power Plants for once through cooling water at 40 CFR Part 423.13(b)1&2.

The existing **three per week** monitoring frequency is being carried forward from the existing permit. The sample type shall be **grab**.

8. Whole Effluent Toxicity (WET):

Section 101(a) of the CWA establishes a national policy of restoring and maintaining the chemical, physical and biological integrity of the Nation's waters. In addition, section 101(a)(3) of the CWA and the State's NJSWQS at N.J.A.C. 7:9B-1.5(a)4 state that the discharge of toxic pollutants in toxic amounts is prohibited. Further, 40 CFR 122.44(d) and N.J.A.C. 7:14A-13.6(a) require that where the Department determines using site-specific WET data that a discharge causes, shows a reasonable potential to cause, or contributes to an

excursion above the NJSWQS, the permitting authority must establish effluent limits for WET. In order to satisfy the requirements of the CWA, the State's NJSWQS and the NJPDES Regulations, the need for a WQBEL for WET was evaluated for this discharge.

In order to determine the need for a WET WQBEL, the Department has analyzed all available WET effluent data. In general, an acceptable data set consists of, at a minimum, 10 data values including the most recent 2½ years of data collection. Based on the review of the applicable data set, the Department has concluded the following:

- After review of the applicable data set, WET was not found in quantifiable amounts in the effluent. Effluent data for the time period of January 2007 through April 2012, which contained 22 non-detectable data points, was utilized for this analysis. The existing permit specifies an acute WET limitation of LC50 $\geq$ 50%, which was originally based on the state minimum effluent standard at N.J.A.C. 7:14A-5.3(a).

On January 5, 2009 the New Jersey Pollutant Discharge Elimination System (NJPDES) Rules were readopted. This readoption repealed N.J.A.C. 7:14A-5.3(a) which contained the state minimum effluent standard for acute WET and instead adopted an acute WET action level of LC50$\geq$50% at N.J.A.C. 7:14A-13.18(f). Therefore, consistent with this requirement, the existing and effective acute WET limitation of LC50$\geq$50% is being replaced with an acute WET action level of LC50$\geq$50% in this renewal. Monitoring and reporting will be required to determine whether the discharge causes, shows a reasonable potential to cause, or contributes to an excursion above the NJSWQS.

Imposing an action level for acute WET will be equally protective of water quality as an effluent limit in this circumstance, since the violation of either the WET limitation or the action level carries with it the same enforceable permit condition to initiate the Toxicity Reduction and Implementation Requirements (TRIR), in order to correct the toxicity problem should this value be exceeded. Therefore, the Department anticipates there will be no change in water quality as a result of this change. This change satisfies the antibacksliding provisions at N.J.A.C. 7:14A-13.19, which incorporate Section 402(o)3 of the Federal Clean Water Act, because it includes the TRIR provisions. Specifically, Section 402(o)3 prohibits the revision of an effluent limit "if the implementation of such limitation would result in a violation of a water quality standard." In this circumstance, violation of either the numerically identical action level or an effluent limitation will trigger an enforceable permit condition to conduct a TRIR in order to address or prevent a violation of a water quality standard.

The test species method to be used for acute testing shall be the *Mysidopsis bahia* 96 hour definitive test. Such selection is based on the saline characteristics of the receiving stream, the existing permit, N.J.A.C. 7:9B-1.5 and N.J.A.C. 7:18, the Regulations Governing the Certification of Laboratories and Environmental Measurements (N.J.A.C. 7:18).

The TRIR are included in accordance with N.J.A.C. 7:14A-13.17(a), 7:14A-6.2(a)5 and recommendations in Section 5.8 of the TSD. The requirements are necessary to ensure compliance with the applicable WET Action Level and to expedite compliance with the WET Action Level should exceedances of the WET Action level occur.

Effluent samples for conducting WET testing are to be collected after the last treatment step, consistent with the collection location for all other parameters.

The existing **quarterly** monitoring frequency is being carried forward from the existing permit. The sample type shall be **composite**.

9. Foam: The narrative foam permit condition is based on N.J.A.C. 7:14A-12.6.

10. 1,2-Dichlorobenzene, 1,4-Dicholorbenzene, Benzene, Toluene, Ethylbenzene:

These parameters all have the same concentration limitation of a daily maximum of 0.05 mg/L, which is being carried forward from the existing permit in accordance with N.J.A.C. 7:14A-13.19. The permittee shall also monitor and report for the monthly average concentration.

The existing monthly monitoring frequencies for 1,2-Dichlorobenzene and 1,4-Dicholorbenzene are being reduced to **once per quarter** since these parameters are not routinely detected in the effluent. The existing frequencies of once per month for Benzene, Toluene, and Ethylbenzene are being carried forward from the existing permit. The sample types shall be **grab**.

DSN 002A: Discharge from Wastewater Treatment Plant

1. Flow:

   This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13.

   For the purpose of calculating the stormwater allocation calculated per the Petroleum Refining ELGs at 40 CFR Part 419.22 (e), the permittee shall calculate stormwater flow in kgal/day when stormwater is treated in the treatment plant.

   Flow shall be measured on a **continuous** basis. The sample type shall be **metered**.

2. 5-Day Biochemical Oxygen Demand (BOD_5):

   The effluent loading limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20 and Part 414. See Section 1 and 2 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations. Monitoring is also required on a concentration basis as a monthly average and a daily maximum.

   The existing monitoring frequency of **once per week** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

3. Total Organic Carbon (TOC):

   The effluent loading limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20 and Part 414. See Section 1 and 2 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations. Monitoring is also required on a concentration basis as a monthly average and a daily maximum.

   The existing monitoring frequency of **three per week** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

4. Total Suspended Solids (TSS):

   The effluent loading limitations are based on the Petroleum ELGs at 40 CFR Part 419.20 and Part 414. See Section 1 and 2 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations. Monitoring is also required on a concentration basis as a monthly average and a daily maximum.

   The monitoring frequency of **once per week** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

5. pH:

The effluent limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20 and Part 414.

The existing monitoring frequency of **once per week** is being carried forward from the existing permit. The sample type shall be **grab**.

6. Oil and Grease:

The effluent loading limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20 and Part 414. See Section 1 and 2 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations. The concentration limitations of 10 mg/L as a monthly average and 15 mg/L as an instantaneous maximum are based on N.J.A.C. 7:14A-12.8(c).

The condition from the existing permit to allow the permittee to use the Petroleum Hydrocarbons test method for the O&G sample is being carried forward in this renewal action. This condition can be found in the comments section of Part III and at Part IV, Section G.3.

The existing monitoring frequency of **three per week** is being carried forward from the existing permit. The sample type shall be **grab**.

7. Ammonia (Total as N):

The effluent loading limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20 and Part 414. See Section 1 and 2 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations. Monitoring is also required on a concentration basis as a monthly average and a daily maximum.

The existing monitoring frequency of **once per week** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

8. Sulfide:

The effluent loading limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20. See Section 1 at the end of this fact sheet for derivation of this and all ELG limitations. Table B gives a summary of all the calculated limitations. Monitoring is also required on a concentration basis as a monthly average and a daily maximum.

The monitoring frequency of **once per week** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

9. Phenolic Compounds:

The effluent loading limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20. See Section 1 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations. Monitoring is also required on a concentration basis as a monthly average and a daily maximum.

The existing monitoring frequency of **once per week** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

10. Total Chromium:

The effluent loading limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20 and Part 414. See Section 1 and 2 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations. Monitoring is also required on a concentration basis as a monthly average and a daily maximum.

The monitoring frequency of **monthly** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

11. Hexavalent Chromium:

The effluent loading limitations are based on the Petroleum Refining ELGs at 40 CFR Part 419.20 and Part 414. See Section 1 and 2 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations. Monitoring is also required on a concentration basis as a monthly average and a daily maximum.

The monitoring frequency of **monthly** is being carried forward from the existing permit. The sample type shall be a **24-hour composite**.

12. OCPSF ELG Parameters:

Mass limits for 56 compounds were calculated by multiplying the flow rate of the Wastewater Treatment Plant (WWTP) of 11.5 MGD times the appropriate limit factor found in the OCPSF tables at 40 CFR 414.91. See Section 2 at the end of this fact sheet for derivation of this and all ELG limitations. Section 3 gives a summary of all the calculated limitations.

The existing monitoring frequencies for all OCPFS ELG organic compound parameters of **quarterly** are being carried forward from the existing permit. The sample type shall be a **24-hour composite** for all parameters with the exception of volatile organics, which shall be **grab**.

13. Whole Effluent Toxicity (WET):

In order to determine the need for a WET WQBEL, the Department has analyzed all available WET effluent data. In general, an acceptable data set consists of, at a minimum, 10 data values including the most recent 2½ years of data collection. Based on the review of the applicable data set, the Department has concluded the following:

- Effluent data from the time period of January 2007 through April 2012 showed that all acute WET samples resulted in non-detectable values (i.e. LC50 = 100%), with the exception of two detectable values of LC 50 = 84% and 91%.

The Department does not have a dilution factor to use in performing a cause analysis for acute WET; therefore, a dilution study is required in this permit. Conditions for this dilution study are specified in Part IV, Section D. At the next permit renewal, an analysis will be performed after the required dilution study has been completed, submitted, and approved. The existing permit specifies an acute WET limit of an LC50$\geq$ 50%, which was originally based on the state minimum effluent standard at N.J.A.C. 7:14A-5.3(a).

On January 5, 2009 the NJPDES Rules were readopted. This readoption repealed N.J.A.C. 7:14A-5.3(a) which contained the state minimum effluent standard for acute WET and instead adopted an acute WET action level of LC50$\geq$50% at N.J.A.C. 7:14A-13.18(f). Therefore, consistent with this requirement, the existing and effective acute WET limitation of LC50$\geq$50% is being replaced with an acute WET action level of LC50$\geq$50% in this renewal. Monitoring and reporting will be required to determine whether the discharge causes, shows a reasonable potential to cause, or contributes to an excursion above the NJSWQS.

Imposing an action level for acute WET will be equally protective of water quality as an effluent limit in this circumstance, since the violation of either the WET limitation or the action level carries with it the same enforceable permit condition to initiate the TRIR, in order to correct the toxicity problem should this value be exceeded. Therefore, the Department anticipates there will be no change in water quality as a result of this change. This change satisfies the antibacksliding provisions at N.J.A.C. 7:14A-13.19, which incorporate Section 402(o)3 of the Federal Clean Water Act, because it includes the TRIR provisions. Specifically, Section 402(o)3 prohibits the revision of an effluent limit "if the implementation of such limitation would result in a violation of a water quality standard." In this circumstance, violation of either the numerically identical action level or an effluent limitation will trigger an enforceable permit condition to conduct a TRIR in order to address or prevent a violation of a water quality standard.

The test species method to be used for acute testing shall be the Mysidopsis bahia 96 hour definitive test. Such selection is based on the saline characteristics of the receiving stream, the existing permit, N.J.A.C. 7:9B-1.5 and N.J.A.C. 7:18, the Regulations Governing the Certification of Laboratories and Environmental Measurements (N.J.A.C. 7:18).

The TRIR are included in accordance with N.J.A.C. 7:14A-13.17(a), 7:14A-6.2(a)5 and recommendations in Section 5.8 of the TSD. The requirements are necessary to ensure compliance with the applicable WET action level and to expedite compliance with the WET action level should exceedances of the WET action level occur.

Effluent samples for conducting WET testing are to be collected after the last treatment step, consistent with the collection location for all other parameters.

The existing **quarterly** monitoring frequency is being carried forward from the existing permit. The sample type shall be **composite**.

14 Foam:

The narrative foam permit condition is based on N.J.A.C. 7:14A-12.6.

15. Toxic Metals, Organic Compounds, and Cyanide:

In accordance with N.J.A.C. 7:14A-13.6(a), a WQBEL shall be imposed when the Department determines pursuant to N.J.A.C. 7:14A-13.5 that the discharge of a pollutant causes an excursion above a NJSWQS.

In order to determine the need for toxic pollutant specific WQBELs, the Department has analyzed all effluent data sets made available to the Department. Acceptable data sets generally consist of, at a minimum, 10 data values including the most recent 2½ years of data collection. A pollutant is considered discharged in "quantifiable amounts" when an exact amount of that pollutant is measured equal to or above the detection level reported by a laboratory analysis (refer to the "Monitoring Report Form (MRF) Reference Manual" at http://www.state.nj.us/dep/dwq/pdf/MRF_Manual.pdf for further information). Based on the review of the data sets, the Department has concluded the following:

- After review of the applicable data sets from DMRs submitted between January 2007 through April 2012, all toxic parameters, with the exception of the parameters listed in the below bullet were not found to be discharged in quantifiable amounts in the effluent (4 or more detected results in the data set). These toxic pollutants are limited to those required to be monitored by the OCPSF ELGs at 40 CFR Part 414.91. The calculations and limitations for these parameters can be found at Section 2.C(6) of the calculation section at the end of this fact sheet in the table entitled "OCPSF – BAT TOXIC POLLUTANT EFFLUENT LIMITS".

- After review of the applicable data sets, **Total Recoverable Copper, Total Recoverable Nickel, Total Cyanide, and Total Recoverable Zinc** were found to be discharged in quantifiable amounts in the effluent. Since a dilution factor for Morses Creek does not currently exist in order for the Department to perform a cause analyses for these four parameters, the Department will carry forward the monitoring on a concentration basis for them and is also imposing requirements to perform a dilution study to allow the Department to perform the cause analyses at the next permit renewal. Conditions for this dilution study are outlined in Part IV, Section D. The Department is imposing mass based effluent limitations for these parameters based on the OCPSF ELG concentrations at 40 CFR 414.91, which are calculated using the metal bearing Chemical Plant Flow, plus an allowance for the Net-Refinery Flow Rate (incidental sources) based on the October 18, 1990 preamble to the Proposed Rule Concentrations. The monitoring frequency of **monthly** for these parameters is being carried forward from the existing permit. The sample types shall be **24-hour composite**.

DSN 003A, DSN 004A, DSN 005A: Non-Contact Cooling Water Discharges

In the existing permit, the Department imposed an effluent characterization study for these three outfalls in order to determine if WQBELs were warranted. The Department has reviewed the data submitted in the "Final Report – Effluent Characterization Study, Chronic Toxicity Characterization Study", dated April 1994, and an additional letter dated February 29, 2000 containing monitoring data. Data submitted was from May 1993 through February 2000.

Parameters that were detected in any of the three point sources include:

Benzene	Lead	Napthalene	Carbon Tetrachloride
Ethylbenzene	Copper	Phenanthrene	Chlorodibromomethane
Toluene	Zinc	Bromoform	Tetrachloroethane
Mercury	Chloroform	2,4 Dimethylphenol	Nickel
Bis(2-Ethylhexyl) Phthalate	Fluorene	Methylene Chloride	

An evaluation of this data shows that the following parameters were detected four or more times during the study:

Benzene	Lead	Bis(2-Ethylhexyl) Phthalate
Copper	Zinc	
Mercury	Nickel	

Considering the age of the data from this sampling and the fact that detection of some of the above listed parameters was inconsistent, the Department is imposing **monthly** monitoring for those parameters (not including Bis(2-Ethylhexyl) Phthalate) that were detected four or more times during the study to provide a sufficient and up to date database to determine if WQBELs are warranted for these pollutants. Since Bis(2-Ethylhexyl) Phthalate is a common laboratory contaminant, the monitoring frequency for Bis(2-Ethylhexyl) Phthalate is imposed at **quarterly**. However, the Department will modify the permit if the sampling shows non-detectable values after four samples to reduce the monitoring frequency to semi-annual. The permittee should submit a request for a minor modification for this once four consecutive samples show non-detectable values. A requirement that reflects this option is found at Part IV, Section F.1(a).

The Department is also imposing **monthly** monitoring and reporting requirements for conventional pollutants (TOC, TSS, Petroleum Hydrocarbons, CPO, Temperature, and pH) for these newly regulated outfalls.

Additionally, the Department is imposing a **semi-annual** monitoring frequency to be reported on a semi-annual WCR for these three outfalls to sample for any priority pollutants that are not being monitored on the monthly DMR to determine if any additional toxics are being discharged through these outfalls.

All samples for these three outfalls shall be performed during a dry weather event with a **grab** sample type.

D. Recommended Quantitation Levels Policy (RQLs):

The Department developed the RQLs to ensure that useful data is provided to the Department in order to characterize the discharger's effluent. The Department recommends that the permittee achieve detection levels that are at least as sensitive as the RQLs found in Part III. The Department has determined that the quantitation levels listed therein can be reliably and consistently achieved by most state certified laboratories for most of the listed pollutants using the appropriate procedures specified in 40 CFR Part 136. FAILURE TO ATTAIN A QUANTITATION LEVEL AS SENSITIVE AS A LISTED RQL IS NOT A VIOLATION OF THE PERMIT, BUT DOES TRIGGER SOME ADDITIONAL REPORTING REQUIREMENTS FOR THE PERMITTEE AS SPECIFIED IN PART IV OF THE PERMIT.

E. Reporting Requirements:

All data requested to be submitted by this permit shall be reported on the Discharge Monitoring Reports (DMRs), Waste Characterization Reports (WCR), and Residual Transfer Reports (RTR) as appropriate and submitted to the Department as required by N.J.A.C. 7:14A-6.8(a).

F. General conditions:

In accordance with N.J.A.C. 7:14A-2.3 and 6.1(b), specific rules from the New Jersey Administrative Code have been incorporated either expressly or by reference in Part I and Part II.

G. Operator Classification Number:

The operator classification requirement is no longer included in the permit. To obtain or determine the appropriate licensed operator classification for the treatment works specified, the permittee shall contact the Bureau of Construction and Connection Permits at (609) 984-4429.

H. Flow Related Conditions:

The numerical value of 11.5 MGD used for flow as a permit condition is consistent with the Northeast Water Quality Management Plan in accordance with N.J.A.C. 7:14A-15.4(b).

I. Residuals/Sludge Conditions:

Industrial sludge in the sludge holding tank is required to be analyzed for the parameters found on Table III-F-1 of Part III. After a thorough review of the parameters required to be analyzed for discharge DSN 002A and all historical sludge data submitted under the Sludge Quality Assurance Regulations (SQAR, N.J.A.C. 7:14C) for this facility, analysis of pesticides (Table VI of SQAR) will no longer be required. However, the volatile organic compounds benzene, ethylbenzene, toluene, and xylene (Tables III and VII of SQAR) were added to Table III-F-1 since these parameters are required to be analyzed for DSN 002A and are commonly found in sludge at similar facilities, and are therefore expected to be present in the sludge. The frequency of monitoring is dependent on the amount of sludge produced. Since the amount of sludge generated is greater than 1,500 but less than 15,000 dry metric tons per year, the frequency of monitoring is once every two calendar months on the Residuals Discharge Monitoring Report. Please note that this increase in monitoring frequency is a result of the November 2011 SQAR amendments. The frequency of reporting for the Residuals Waste Characterization Report changes from monthly to annually at the beginning of the calendar year after the effective date of the permit. The frequency of reporting for the Residuals Transfer Report remains monthly.

All treatment works with a discharge regulated under N.J.A.C. 7:14A must have permits that implement applicable technical standards for residuals management. Generally, the permit issued to the treatment works generating the

residual will include applicable residual quality monitoring as well as other general conditions required by N.J.A.C. 7:14A-6. In addition, the permit may include conditions related to any aspect of residual management developed on a case-by-case basis where the Department determines that such conditions are necessary to protect public health and the environment.

The permit may also include conditions establishing requirements for treatment works that send residual to other facilities for final use or disposal. Thus, **ALL** residual preparers (that is, generators as well as persons who manage the residual) are required to submit basic information concerning their residual use and disposal practices. This basic information is submitted by compliance with the Sludge Quality Assurance Regulations (N.J.A.C. 7:14C).

The documents listed below have been used to establish the residual conditions of the Draft Permit:

a. United States Environmental Protection Agency "Standards for the use or disposal of sewage sludge" (40 CFR Part 503),
b. "New Jersey Pollutant Discharge Elimination System" (N.J.A.C. 7:14A),
c. Technical Manual for Residuals Management, May 1998,
d. USEPA Part 503 Implementation Guidance, EPA 833-R-95-001, October 1995. This document is a compilation of federal requirements, management practices and EPA recommended permit conditions for sewage sludge use and management practices,
e. USEPA A Plain English Guide to the EPA Part 503 Biosolids Rule, EPA/832/R-93/003, September 1994,
f. New Jersey "Statewide Sludge Management Plan", January 2006 and
g. New Jersey "Sludge Quality Assurance Regulations" (SQAR), N.J.A.C. 7:14C.

J. Biocides or Other Cooling Water Additives:

The Department has approved the permittee's request to use the following corrosion inhibitors, biocides, or other cooling water additives in its non-contact cooling water: **sodium bromide, bleach, Clam-Trol CT-2, DTS (inert detoxicant), Bio-Trol 88P, Betz 455 Deposit Control, or similar chemical compounds due to changes in vendors or names.**

Approved chemicals specifically for use in the Polypropylene and Infineum Chemical Cooling Tower water include: **Phosphate based corrosion inhibitors (Trasar N-23265, N-73282, N-73286 or similar), sodium bromide (Acti-Brom N-7342, Spectrus OX1201 or similar), glutaraldehyde (N-7338 or similar), biodispersant (Spectrus BD1500 or similar), Continuum AEC3157 or similar, Spectrus NX1100 or similar, and bleach.**

If the permittee decides to begin using any additional additives in the future, the permittee must notify the Bureau of Surface Water Permitting at least 180 days prior to use so that the permit may be reopened to incorporate any additional limitations deemed necessary.

K. Dilution Study Requirement for DSN 002A:

A requirement to perform a dilution study has been included in this permit pursuant to N.J.A.C. 7:14A-2.12(b) and N.J.A.C. 7:14A-13.21(e)3. This dilution study is necessary to allow the Department to perform cause analyses for any WET or toxic pollutants consistently present in the discharge. Conditions regarding this study can be found in Part IV, Section D.

L. Polychlorinated Biphenyl (PCB) Sampling and Pollutant Minimization Plan (PMP):

The United States Environmental Protection Agency and the International Agency for Research on Cancer have concluded that PCBs are carcinogenic to humans. The primary non-occupational source of human PCB exposure is food, especially fish and shellfish from contaminated waters. PCBs persist in the environment, accumulate in

the tissue of fish and other animals, and biomagnify through the food chain. The Department has, therefore, adopted rules at N.J.A.C. 7:14A-11.13 and 14.4 on December 18, 2006 to reduce discharges of PCBs to New Jersey's surface waters from industrial facilities and sewage treatment plants. The regulations at N.J.A.C. 7:14A-11.13 outline the PCB monitoring requirements and the regulations at N.J.A.C. 7:14A-14.4 outline the monitoring frequency requirements.

The *New Jersey 2010 Integrated Water Quality Monitoring and Assessment Report (integrated report)* lists pollutants that are currently not meeting the surface water criteria in subwatersheds throughout the state. Since this facility discharges to a subwatershed that is listed as impaired for PCBs under a Fish Advisory in the Integrated Report, more specifically, Sublist 5 of the New Jersey List Of Water Quality Limited Waters (also known as the 303(d) List or as the Impaired Waterbodies List), this facility is subject to the rules at N.J.A.C. 7:14A-11.13 and 14.4.

Since this facility is subject to these rules, the permittee is required to monitor its effluent for the 209 PCB congeners at DSN 002A, using the most recent version of EPA Method 1668 as found at EPA 40 CFR Part 136. Sampling will consist of up to 6 samples during a period of 24 months from the effective date of the permit, not to exceed three dry samples and three wet samples, and will be performed using a 24 hour composite sample method for dry weather events and a grab sample for wet weather events. However, since wet weather discharges are hard to characterize due to retention time in the equalization basins of the WWTP, the Department concurs that the composite samples required should be performed independent of wet weather. However, in lieu of wet weather sampling and since the effluent is commingled process and stormwater, the Department has determined that the permittee should perform 6 samples over the specified 24 month period. The permittee should make every effort to ensure that these samples are representative of the total discharge from DSN 002A.

Based on the results of the monitoring, which is to be submitted to the Department when all sampling is completed, the Department will make a determination regarding whether this facility will be required to develop and implement a PCB Pollutant Minimization Plan, or PMP. The purpose of the PMP is to help identify and eliminate discrete sources of PCBs. A facility discharging at or close to background levels is far less likely than a facility discharging at significantly higher levels to be able to identify discrete sources of PCBs. Therefore, the Department will require PMPs for this facility if it is found to be discharging more elevated levels of PCBs in the effluent, but not if the permittee is discharging PCB levels at or close to background.

The Department has developed a PMP Technical Manual to help permittees with the development of the PMP, which can be found on the Department's web site at http://www.state.nj.us/dep/dwq/techman.htm.

If based on the monitoring for PCBs, it is determined that the permittee must develop and implement a PCB PMP, the permittee will be required to submit an Annual PMP Progress Report. These reports will be used to update the Department regarding any revisions to the PMP, measures taken to achieve reductions, and changes to the baseline loading.

These conditions have been incorporated into the permit at Part IV, Section D.

12 Variances to Permit Conditions:

A thermal variance is granted with respect to temperature, in accordance with Section 316(a) of the Clean Water Act.

Procedures for modifying a WQBEL are found in the New Jersey NJSWQS, N.J.A.C. 7:9B-1.8 and 1.9. If a WQBEL has been proposed in this permit action, the permittee may request a modification of that limitation in accordance with N.J.A.C. 7:14A-11.7(a). This request must be made prior to the close of the public comment period. The information that must be submitted to support the request may be obtained from the Bureau of Water Quality Standards and Assessment at (609) 777-1753.

13 Description of Procedures for Reaching a Final Decision on the Draft Action:

Please refer to the procedures described in the public notice that is part of the draft permit. The public notice for this permit action is published in the *Star Ledger* and in the DEP Bulletin.

14 Contact Information

If you have any questions regarding this permit action, please contact Robert Hall, Bureau of Surface Water Permitting at (609) 292-4860.

15 Permit Summary Tables

Unless otherwise noted, all effluent limitations are expressed as maximums. Dashes (--) indicate there is no effluent data, no limitations, or no monitoring for this parameter depending on the column in which it appears.

DSN 001A: Morses Creek Discharge at Dam No. 1

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA 1/2007-4/2012	EXISTING LIMITS	FINAL LIMITS
Flow	MGD	Monthly Avg.	159.2	MR	MR
		Daily Max.	467	MR	MR
Flow, Intake	MGD	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Total Suspended Solids (TSS), Intake	mg/L	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Total Suspended Solids (TSS), Effluent Gross	mg/L	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Total Suspended Solids (TSS), Net	mg/L	Monthly Avg.	1.1	30	30
		Daily Max.	68	50	50
Total Organic Carbon (TOC), Net	kg/day	Monthly Avg.	356.3	MR	MR
		Daily Max.	4248	6241	6241
Total Organic Carbon (TOC), Intake	mg/L	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Total Organic Carbon (TOC), Effluent Gross	mg/L	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Total Organic Carbon (TOC), Net	mg/L	Monthly Avg.	0.70	MR	MR
		Daily Max.	5.0	MR	MR
Oil and Grease, Net	Kg/d	Monthly Avg.	412.1	MR	MR
		Instant Max.	1840	2260	2260
		# ND/# Det.	45/19	--	--
Oil and Grease, Intake	mg/L	Monthly Avg.	--	--	MR
		Instant Max.	--	--	MR
		# ND/# Det.			
Oil and Grease, Effluent Gross	mg/L	Monthly Avg.	--	--	MR
		Instant Max.	--	--	MR
		# ND/# Det.			
Oil and Grease, Net	mg/L	Monthly Avg.	0.84	10	10
		Instant Max.	4.0	15	15
		# ND/# Det.	45/19	--	--
Net Rate of Addition of Heat	MBTU /HR	Monthly Avg.	990.6	MR	MR
		Instant. Max.	1630	2300	2300
Temperature Difference between Intake and Discharge	°C	Monthly Avg.	10.0	MR	MR
		Daily Max.	15	15	15
Intake Temperature	°C	Monthly Avg.	13.5	MR	MR
		Daily Max.	26	MR	MR
Effluent Temperature	°C	Monthly Avg.	23.2	NL	NL
		Daily Max.	36	35	35
Effluent pH	su	Instant. Min.	6.7	6.0	6.0
		Instant. Max.	8.2	9.0	9.0

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA 1/2007-4/2012	EXISTING LIMITS	FINAL LIMITS
Chlorine Produced Oxidants	mg/L	Month Avg. Daily Max. # ND/# Det.	<0.1 <0.1 64/0	MR 0.20 --	MR 0.20 --
1,2-Dicholorobenzene	mg/L	Monthly Avg. Daily Max. # ND/# Det.	< 0.001 <0.001 64/0	MR 0.05 --	MR 0.05 --
1,4-Dicholorobenzene	mg/L	Monthly Avg. Daily Max. # ND/# Det.	< 0.001 <0.001 64/0	MR 0.05 --	MR 0.05 --
Toluene	mg/L	Monthly Avg. Daily Max. # ND/# Det.	0.0045 0.044 53/11	MR 0.05 --	MR 0.05 --
Benzene	mg/L	Monthly Avg. Daily Max. # ND/# Det.	0.002 0.018 56/8	MR 0.05 --	MR 0.05 --
Ethylbenzene	mg/L	Monthly Avg. Daily Max. # ND/# Det.	0.0018 0.011 58/6	MR 0.05 --	MR 0.05 --
Acute Toxicity, LC50 *Mysidopsis bahia*	%	Minimum	>100 (22 points)	50	MR (1)

Footnotes and Abbreviations:

MR Monitor and report only

(1) The permittee is required to comply with an Acute WET Action Level of LC50 $\geq$ 50%.

DSN 002A: Wastewater Discharge from Treatment Plant

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA 1/2007-4/2012	EXISTING LIMITS	FINAL LIMITS
Flow	MGD	Monthly Avg.	9.01	MR	MR
		Daily Max.	22	MR	MR
5 Day Biochemical Oxygen Demand (BOD_5)	kg/d	Monthly Avg.	36.19	1,570	1,085
		Daily Max.	167	2,840	2,088
		# ND / # Det.	36/28	--	
5 Day Biochemical Oxygen Demand (BOD_5)	mg/L	Monthly Avg.	1.8	MR	MR
		Daily Max.	6.0	MR	MR
		# ND / # Det.	32/32	--	
Total Organic Carbon (TOC)	kg/d	Monthly Avg.	376.36	3,450	2,388
		Daily Max.	1062	6,510	4,597
Total Organic Carbon (TOC)	mg/L	Monthly Avg.	14.7	MR	MR
		Daily Max.	69	MR	MR
Total Suspended Solids (TSS)	kg/d	Monthly Avg.	283.28	1,360	954
		Daily Max.	2157	2,520	1,843
Total Suspended Solids (TSS)	mg/L	Monthly Avg.	9.80	MR	MR
		Daily Max.	75	MR	MR
Oil and Grease	kg/d	Monthly Avg.	22.14	467	298
		Instant Max.	164	870	558
		# ND / # Det.	31/33	--	--
Oil and Grease	mg/L	Monthly Avg.	1.06	10	10
		Instant Max.	6.0	15	15
		# ND / # Det.	29/35	--	
Effluent pH	s.u.	Instant Min.	6.8	6.0	6.0
		Instant Max.	8.5	9.0	9.0
Ammonia (Total as N)	kg/d	Monthly Avg.	3.30	769	525
		Daily Max.	116	1,690	1155
		# ND / # Det.	62/2		
Ammonia (Total as N)	mg/L	Monthly Avg.	0.10	MR	MR
		Daily Max.	3.7	MR	MR
		# ND / # Det.	62/7		
Sulfide	kg/d	Monthly Avg.	0.71	7.4	4.9
		Daily Max.	7.1	16.6	11
		# ND / # Det.	23/41	--	
Sulfide	mg/L	Monthly Avg.	0.02	MR	MR
		Daily Max.	0.3	MR	MR
		# ND / # Det.	23/41		
Cyanide, Total (as CN)	kg/day	Monthly Avg.	3.25	6.7	6.8
		Daily Max.	8.9	11	10
		# ND / # Det.	23/41	--	
Cyanide, Total (as CN)	mg/L	Monthly Avg.	0.094	MR	MR
		Daily Max.	0.29	MR	MR
		# ND / # Det.	23/41	--	
Phenolic Compounds	kg/day	Monthly Avg.	0.47	6.7	7.6
		Daily Max.	1.8	24.5	16
		# ND / # Det.	58/6	--	

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA 1/2007-4/2012	EXISTING LIMITS	FINAL LIMITS
Phenolic Compounds	mg/L	Monthly Avg. Daily Max. # ND / # Det.	0.24 0.07 58/6	MR MR --	MR MR
Hexavalent Chromium	kg/day	Monthly Avg. Daily Max. # ND / # Det.	0.0 0.0 64/0	0.46 1.1	0.7 1.4
Total Chromium	kg/day	Monthly Avg. Daily Max. # ND / # Det.	0.032 1.0 46/18	11 30 --	11.9 32.6
Total Chromium	mg/L	Monthly Avg. Daily Max. # ND / # Det.	0.0024 0.018 34/30	MR MR --	MR MR
Total Copper	kg/day	Monthly Avg. Daily Max. # ND / # Det.	0.32 1.6 31/33	8.0 18 --	6.8 14.7
Total Copper	mg/L	Monthly Avg. Daily Max. # ND / # Det.	0.0087 0.038 31/33	MR MR --	MR MR
Total Lead	kg/day	Monthly Avg. Daily Max. # ND / # Det.	0.184 0.5 54/10	5.6 7.5 --	5.8 7.3
Total Lead	mg/L	Monthly Avg. Daily Max. # ND / # Det.	0.0058 0.016 24/10	MR MR --	MR MR
Total Nickel	kg/day	Monthly Avg. Daily Max. # ND / # Det.	0.56 1.5 61/2	18 29 --	17.1 26.4
Total Nickel	mg/L	Monthly Avg. Daily Max. # ND / # Det.	0.016 0.035 61/3	MR MR --	MR MR
Total Zinc	kg/day	Monthly Avg. Daily Max. # ND / # Det.	1.94 13.5 8/56	7.2 15 --	6.5 12.9
Total Zinc	mg/L	Monthly Avg. Daily Max. # ND / # Det.	0.06 0.35 8/56	MR MR --	MR MR
OCPFS Pollutants (56)	kg/day	Monthly Avg. Daily Max.	Very few detected values, all very low levels	See Existing Permit	See Section 2, Item C.6
Acute Toxicity, LC50	%	Minimum	>100% (20 data points) 84%, 91%	50	MR (1)

Footnotes and Abbreviations:

MR Monitor and report only

(1) The permittee is required to comply with an Acute WET Action Level of LC50 > 50%.

DSN 003A: #2 Dam Condenser (Non-Contact Cooling Water)

PARAMETER	UNITS	AVERAGING PERIOD	#2 DAM CONDENSER SEWER DISCHARGE WASTEWATER DATA (1)	General NCCW Limitations for Conventionals	Final Monitoring Requirements*
Flow	MGD	Monthly Avg.	--	MR	MR
		Daily Max.	25-40	MR	MR
Total Organic Carbon (TOC)	mg/L	Monthly Avg.	3.23	MR	MR
		Daily Max.	5.32	20	MR
		#Det/#N.D.	7/2	--	--
Total Suspended Solids (TSS)	mg/L	Monthly Avg.	23.68	MR	MR
		Daily Max.	46	20	MR
Petroleum Hydrocarbons	mg/L	Monthly Avg.	1.61	MR	MR
		Instant Max.	1.78	10	MR
		#Det/#N.D.	2/10	--	--
Effluent Temperature	°F	Monthly Avg.	74.84	MR	MR
		Daily Max.	93.9	86	MR
Effluent pH	su	Instant Min.	--	6.0	MR
		Instant Max.	--	9.0	MR
Chlorine Produced Oxidants	mg/L	Monthly Avg.	--	MR	MR
		Daily Max.	--	0.10	MR
Zinc, Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Zinc, Recoverable	µg/L	Monthly Avg.	40.5	--	MR
		Daily Max.	77	--	MR
Lead, Total Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Lead, Total Recoverable	µg/L	Monthly Avg.	16	--	MR
		Daily Max.	16	--	MR
Copper, Total Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Copper, Total Recoverable	µg/L	Monthly Avg.	24	--	MR
		Daily Max.	24	--	MR
Nickel, Total Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Nickel, Total Recoverable	µg/L	Monthly Avg.	57	--	MR
		Daily Max.	57	--	MR
Mercury, Total Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Mercury, Total Recoverable	µg/L	Monthly Avg.	2.95	--	MR
		Daily Max.	3.0	--	MR
Benzene	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Benzene	µg/L	Monthly Avg.	13.5	--	MR
		Daily Max.	920 (2)	--	MR

PARAMETER	UNITS	AVERAGING PERIOD	#2 DAM CONDENSER SEWER DISCHARGE WASTEWATER DATA (1)	General NCCW Limitations for Conventionals	Final Monitoring Requirements*
Bis(2-ethyl-hexyl) phthalate	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Bis(2-ethyl-hexyl) phthalate	µg/L	Monthly Avg. Daily Max.	27 45	-- --	MR MR
Chronic Toxicity, IC25	T.U.	Minimum	--	--	MR

* Sampling shall be performed during dry weather.

DSN 004A: Poly Ditch (Non-Contact Cooling Water)

PARAMETER	UNITS	AVERAGING PERIOD	POLY DITCH WASTE WATER DATA (1)	General NCCW Limitations for Conventionals	Final Monitoring Requirements *
Flow	MGD	Monthly Avg.	--	MR	MR
		Daily Max.	2-10	MR	MR
Total Organic Carbon (TOC)	mg/L	Monthly Avg.	4.18	MR	MR
		Daily Max.	6.27	20	MR
		#Det/#N.D.	7/2	--	--
Total Suspended Solids (TSS)	mg/L	Monthly Avg.	20.27	MR	MR
		Daily Max.	50	20	MR
Petroleum Hydrocarbons	mg/L	Monthly Avg.	1.67	MR	MR
		Instant Max.	1.67	10	MR
		#Det/#N.D.	1/11	--	--
Effluent Temperature	°F	Monthly Avg.	60.28	MR	MR
		Daily Max.	85.8	86	MR
Effluent pH	su	Instant Min.	--	6.0	MR
		Instant Max.	--	9.0	MR
Chlorine Produced Oxidants	mg/L	Monthly Avg.	--	MR	MR
		Daily Max.	--	0.10	MR
Zinc, Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Zinc, Recoverable	µg/L	Monthly Avg.	55	--	MR
		Daily Max.	74	--	MR
Lead, Total Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Lead, Total Recoverable	µg/L	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
		#Det/#N.D.	0/12		
Copper, Total Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Copper, Total Recoverable	µg/L	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
		#Det/#N.D.	0/12		
Nickel, Total Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Nickel, Total Recoverable	µg/L	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
		#Det/#N.D.	0/12		
Mercury, Total Recoverable	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Mercury, Total Recoverable	µg/L	Monthly Avg.	4	--	MR
		Daily Max.	5	--	MR

PARAMETER	UNITS	AVERAGING PERIOD	#2 DAM CONDENSER SEWER DISCHARGE WASTEWATER DATA (1)	General NCCW Limitations for Conventionals	Final Monitoring Requirements *
Benzene	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Benzene	µg/L	Monthly Avg. Daily Max.	22.86 130	-- --	MR MR
Bis(2-ethyl-hexyl) phthalate	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Bis(2-ethyl-hexyl) phthalate	µg/L	Monthly Avg. Daily Max.	5.2 23	-- --	MR MR
Chronic Toxicity, IC25	T.U.	Minimum	--	--	MR

* Sampling shall be performed during dry weather.

DSN 005A: Railroad Avenue Ditch (Non-Contact Cooling Water)

PARAMETER	UNITS	AVERAGING PERIOD	RAILROAD AVE. DITCH WASTE WATER DATA (1)	General NCCW Limitations for Conventionals	Final Monitoring Requirements*
Flow	MGD	Monthly Avg. Daily Max.	-- 100-140	MR MR	MR MR
Total Organic Carbon (TOC)	mg/L	Monthly Avg. Daily Max. #Det/#N.D.	7.13 8.15 7/2	MR 20 --	MR MR --
Total Suspended Solids (TSS)	mg/L	Monthly Avg. Daily Max.	25.53 62	MR 20	MR MR
Petroleum Hydrocarbons	mg/L	Monthly Avg. Instant Max. #Det/#N.D.	16.82 61 4/8	MR 10 --	MR MR --
Effluent Temperature	°F	Monthly Avg. Daily Max.	81.05 112.0	MR 86	MR MR
Effluent pH	su	Instant Min. Instant Max.	-- --	6.0 9.0	MR MR
Chlorine Produced Oxidants	mg/L	Monthly Avg. Daily Max.	-- --	MR 0.10	MR MR
Zinc, Recoverable	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Zinc, Recoverable	µg/L	Monthly Avg. Daily Max.	41.57 67	-- --	MR MR
Lead, Total Recoverable	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Lead, Total Recoverable	µg/L	Monthly Avg. Daily Max.	17 17	-- --	MR MR
Copper, Total Recoverable	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Copper, Total Recoverable	µg/L	Monthly Avg. Daily Max.	38.5 46	-- --	MR MR
Nickel, Total Recoverable	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Nickel, Total Recoverable	µg/L	Monthly Avg. Daily Max. #Det/#N.D.	-- -- 0/12	-- --	MR MR
Mercury, Total Recoverable	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Mercury, Total Recoverable	µg/L	Monthly Avg. Daily Max.	4 4	-- --	MR MR
Benzene	kg/day	Monthly Avg. Daily Max.	-- --	-- --	MR MR

PARAMETER	UNITS	AVERAGING PERIOD	#2 DAM CONDENSER SEWER DISCHARGE WASTEWATER DATA (1)	General NCCW Limitations for Conventionals	Final Monitoring Requirements *
Benzene	µg/L	Monthly Avg.	130	--	MR
		Daily Max.	130	--	MR
Bis(2-ethyl-hexyl) phthalate	kg/day	Monthly Avg.	--	--	MR
		Daily Max.	--	--	MR
Bis(2-ethyl-hexyl) phthalate	µg/L	Monthly Avg.	31.27	--	MR
		Daily Max.	78	--	MR
Chronic Toxicity, IC25	T.U.	Minimum	--	--	MR

Footnotes and Abbreviations:

MR Monitor and report only

* Sampling shall be performed during dry weather.

(1) Wastewater data originates from the "Final Report – Effluent Characterization Study, Chronic Toxicity Characterization Study", dated April 1994, and an additional monitoring report dated February 29, 2000. Data submitted was from 5/1993 through 2/2000. All other toxics were non-detectable values.

(2) This data point is a spike in the data set for 3/8/97and was not used in the calculation of the monthly average. There was also another spike of 400 ug/L on 9/28/95 that was not used in the average calculation.

16 Contents of the Administrative Record

The following items are used to establish the basis of the Draft Permit:

Rules and Regulations:

1. 33 U.S.C. 1251 et seq., Federal Water Pollution Control Act. [C]
2. 40 CFR Part 131, Federal Water Quality Standards. [A] [C]
3. 40 CFR Part 122, National Pollutant Discharge Elimination System. [C]
4. N.J.S.A. 58:10A-1 et seq., New Jersey Water Pollution Control Act. [A] [B]
5. N.J.A.C. 7:14A-1 et seq., New Jersey Pollutant Discharge Elimination System Regulations. [A] [B]
6. N.J.A.C. 7:9B-1 et seq., New Jersey Surface Water Quality Standards. [A] [B]
7. N.J.A.C. 7:9-5.1 et seq., Wastewater Discharge Requirements. [A] [B]
8. N.J.A.C. 7:15, Statewide Water Quality Management Planning Rules. [A] [B]
9. N.J.A.C. 7:14C, Sludge Quality Assurance Regulations. [B]

Guidance Documents / Reports:

1. "Field Sampling Procedures Manual", published by the NJDEP. [A]
2. "Discharge Monitoring Report (DMR) Instructional Manual", published by the NJDEP. [A]
3. "EPA Technical Support Document for Water Quality-based Toxics Control", EPA/505/2-90-001, March 1991. [A]
4. New Jersey's 2010 Integrated Water Quality Monitoring and Assessment Report (includes 305 (b) Report 303(d) List). [A] [B]
5. USEPA Region II Memorandum, EPA Region II Revised Guidance for Cooling Water and Storm Water Runoff, September 5, 1991 (John S. Kushwara, Acting Chief, Water Permits and Compliance Branch, USEPA, Region II).

Permits / Applications:

1. NJPDES/DSW Permit Application dated 10/27/1997 and subsequent submittals dated 8/8/2000, 9/28/2006, and 6/18/2012. [A]
2. Existing NJPDES/DSW Permit NJ0001511, issued 3/31/93 and effective 5/1/93. [A]
3. Modification to NJPDES/DSW Permit NJ0001511, issued 4/30/90 and effective on 6/1/93 [A].

Correspondences:

1. Correspondence 2/8/2005 from Pilar Patterson of NJDEP to Tyrone Chichester of DuPont stating that the diversion of process wastewater from the DuPont Sulfuric Acid Regeneration Facility to the Bayway Wastewater Treatment Plant does not trigger the criteria at N.J.A.C. 7:14A-16.4 which would require a permit modification to the ConocoPhillips Bayway Refinery NJPDES permit.
2. Correspondence dated 12/27/95, submitted to the Department from Bayway Refinery Company, which contained supplemental data for the "Final Report: Effluent Characterization Study, Chronic Toxicity Characterization Study".
3. Correspondence dated 9/28/06 submitted to the Department supplementing the NJ0001511 permit renewal application with a comprehensive set of correspondence and studies applicable to the renewal application.
4. Correspondence emails from George Bakun of Phillips 66 Company to Robert Hall of NJDEP dated June 18, 2012 and June 19, 2012 regarding updated refinery production rates and treatment plant flow rates to be used in effluent limitation calculations.

Meetings / Site Visits:

1. Site Visit on 10/1/2012.

Studies:

1. "Final Report: Effluent Characterization Study, Chronic Toxicity Characterization Study", dated 4/11/94, and prepared by Bayway Refinery Company.
2. Intake and Thermal Discharge Studies, April 1995.

Other:

1. Standard Compliance Inspection and Evaluation Reports from the Department's NJEMS system for enforcement site visits to the facility on 5/24/2007, 6/24/2008, 6/2/2009, 6/20/2011.
2. Discharge Monitoring Report (DMR) data from the Department's NJEMS system from 1/2007 through 3/2012.

Footnotes:

[A] Denotes items that may be found in the NJPDES/DSW Administrative Record Library located in the NJDEP Central File Room, 401 East State Street, Trenton, New Jersey.

[B] Denotes items that may be found on the New Jersey Department of Environmental Protection (NJDEP) website located at "http://www.state.nj.us/dep/".

[C] Denotes items that may be found on the United States Environmental Protection Agency (USEPA) website at "http://www.epa.gov/".

17. CALCULATION OF TECHNOLOGY BASED LIMITATIONS USING EFFLUENT LIMITATION GUIDELINES

Section 1: 40 CFR Part 419.20 Subpart B-Cracking Subcategory

1. Calculation Procedure for the derivation of BPT/BCT limitations for BOD_5, TOC, TSS, Oil and Grease; BPT level of treatment for Phenolics, Total Chromium, and Hexavalent Chromium; and BPT and BAT levels of treatment for Ammonia and Sulfide:

   In accordance with 40 CFR 419.22, 23 and 24(a), any existing point source subject to these subparts must achieve the effluent limitations specified in the tables in these sections. Furthermore, these limits are to be multiplied by the Size Factor and Process Factor specified in the tables at 40 CFR 419.22, 23 and 24(b)(1) and (2). This calculation procedure is illustrated in the Section 1 at the end of this section.

   As illustrated in the example calculation at 40 CFR 419.42(b)(3), the Process Factor (PF) is based on the Total Process Configuration Factor, which in turn is calculated by adding the weighted unit process configuration factors of the unit processes operational at this refinery that are included in the flow model described in Section IX, Pages 148-151 of the Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Petroleum Refining Point Source Category, EPA 440/1-74-014-a, April 1974 (1974 Flow Model). Unless specifically authorized by the USEPA, refinery unit processes other than those listed in this section may not be used to calculate the applicable technology based limitations.

   Refinery Feedstock (kBbl/D)
   Crude = 255
   FCC Feed = 42
   Other = 3
   Total = 300

Feedstock Rate = 300, 000 barrels/day (used for limit calculations)

PROCESS	CAPACITY (1,000 BBLs)	CAPACITY RELATIVE TO THRUPUT	WEIGHING FACTOR(1)	PROCESS CONFIGURATION
CRUDE:				
Atmospheric Pipestill	255	0.85	1	
Desalting	255	0.85	1	
Vacuum Pipestill	69	0.23	1	
TOTAL CRUDE =	**579**	**1.93**	**1**	**1.93**
CRACKING/COKING				
Fluid Cat. Cracking (FCC)	140	0.47	6	
Hydrotreating (2)	156	0.52 (2)	0(2)	
TOTAL CRACK./COKING =	**296**	**0.47**	**6**	**2.8**
REFORMING/ALKLATION (2):				

Alkylation:	19.5	0.065	0	
Catalytic Reforming:	30	0.1	0	
TOTAL REFORMING/ ALKLATION =	**49.5**	**0.075**	**0**	**0**
PROCESS CONFIGURATION =				**4.73**
PROCESS FACTOR =				**0.88**

Footnotes:

(1) Weighting Factors for the individual processes operational at the refinery are specified in the 1974 Flow Model and are also included in the example calculation at 40 CFR 419.42(b)3.
(2) Although Hydrotreating and H2SO4 Alkylation are operational at this refinery, these processes were not included in the 1974 Flow Model that was used to develop the weighting factors; therefore, the weighting factors for these processes were given a value of 0 and they do not affect the calculated value for the Total Refinery Process Configuration that is used to determine the BPT and BCT limitations for all regulated parameters and BAT limitations for Ammonia (as N) and sulfide (as S).

In accordance with 40 CFR 419.22, 23 and 24(b)(1), based on a current Refinery Feedstock Rate (RFR) of 300,000 bbl/day, the corresponding **Size Factor (SF) is 1.41.**

In accordance with 40 CFR 419.22, 23 and 24(b)(2), the **Process Factor** for the calculated Total Process Configuration of 4.73 = **0.88.**

Effluent Limit (kg/day) = (Size Factor) (Process Factor) (Refinery Feedstock Rate, KBbls/day) (ELG, lbs/KBbls) / (2.2 kg/d/lbs/d)

= (372 Kbbls/day) (Effluent Limit Factor lbs/day) / 2.2

Pollutant	Limits Max./Day Lbs./1000 bbl	Limits 30 day avg. Lbs./1000 bbl	SF	PF	RFR Kbbls/day	**Production Based Limitation Max/day (kg/day)**	**Production Based Limitation 30 day avg. (kg/day)**
BPT/BCT (1)							
BOD_5	9.9	5.5	1.41	0.88	300	**1,674**	**930**
TOC (3)	21.8	12.1	1.41	0.88	300	**3,686.2**	**2,046**
TSS	6.9	4.4	1.41	0.88	300	**1,167**	**744**
O&G	3	1.6	1.41	0.88	300	**507**	**271**
BPT/BAT (2)							
Ammonia	6.6	3	1.41	0.88	300	**1,116**	**507**
Sulfide	0.065	0.029	1.41	0.88	300	**11.0**	**4.9**
BPT							
Phenolic Compounds	0.074	0.036	1.41	0.88	300	**12.5**	**6.1**

Pollutant	Limits Max./Day Lbs./1000 bbl	Limits 30 day avg. Lbs./1000 bbl	SF	PF	RFR Kbbls/day	**Production Based Limitation Max/day (kg/day)**	**Production Based Limitation 30 day avg. (kg/day)**
Total Chromium	0.15	0.088	1.41	0.88	300	**25.4**	**14.9**
Hexavalent Chromium	0.012	0.0056	1.41	0.88	300	**2.02**	**0.95**

Footnotes:

(1) BPT and BCT effluent limitations for these parameters are identical
(2) BPT and BAT effluent limitations for these parameters are identical
(3) TOC used instead of COD due to chlorine interference, per 40 CFR 419.12(e). TOC limit factor = 2.2 x BOD5 limit factor.

Since the effluent limitations for BPT and BCT levels of treatment specified at 40 CFR 419.22(a) and 24(a) respectively are identical, the final calculated BPT and BCT limitations for BOD5, TSS, and Oil and Grease are the same numerical values. Similarly, the effluent limitations for BPT and BAT levels of treatment specified at 40 CFR 419.22 and 23(a) are identical; therefore, the final calculated BPT and BAT limitations for COD, Ammonia and Sulfide are the same numerical values.

2. Calculation Procedure for the derivation of BAT limitations for Phenolic Compounds, Total Chromium and Hexavalent Chromium:

In accordance with 40 CFR 419.23(c)(1)(i), BAT limits for Phenolic Compounds, Total Chromium and Hexavalent Chromium are the sum of the products of each effluent limitation factor listed in 40 CFR 419.23(c)(1)(i) times the applicable process feedstock rate. Applicable production processes are included in Appendix A to 40 CFR 419 and are based on the Refined Flow Model described in the Development Document (Final) for Effluent Limitation Guidelines and Standards for the Petroleum Refining Point Source Category, EPA 440/1-82/014, October 1982.

The six processes operational at the refinery, namely Atmospheric Crude Distillation, Crude Desalting, Vacuum Crude Distillation, Fluid Catalytic Cracking, Hydrotreating of final product, Sulfuric Acid Alkylation, and Catalytic Reforming are included in the list of processes in the aforementioned document. Therefore, the final effluent limitations for Total Phenolics, Total Chromium, and Hexavalent Chromium are calculated as follows:

Considering the process chart at Item1 above, the Feedstock Rates are:

Crude = C= 579
Cracking/Coking = C/C = 296
Reforming/Alkylation = RA = 49.5

For each of the regulated pollutant parameters below, **the effluent limitation is the sum of the products of each effluent limitation factor times the applicable process feedstock rate divided by 2.2 lbs./kg.**

Pollutants	**Feedstock**	**ELG**		**Tech. Based**	
	Rate	lbs. Per 1,000 gallons		Effluent Limit, kg/day	
		max.	avg.	max.	avg.
Phenolic Compound					
	579	0.013	0.003	3.4	0.8

C					
C/C	296	0.147	0.036	19.8	4.8
RA	49.5	0.132	0.032	3.0	0.7
Total				**26.2**	**6.3**
Total Chromium					
C	579	0.011	0.004	2.9	1.1
C/C	296	0.119	0.041	16	5.5
RA	49.5	0.107	0.037	2.4	0.8
Total				**21.3**	**7.4**
Hexavalent Chromium					
C	579	0.0007	0.0003	0.2	0.1
C/C	296	0.0076	0.0034	1.0	0.5
RA	49.5	0.0069	0.0031	0.2	0.1
Total				**1.4**	**0.7**

3. Comparing the BPT and BAT limits for Phenolic Compounds, Total Chromium and Hexavalent Chromium:

Limits	Phenolic Compounds	Phenolic Compounds	Total Chromium	Total Chromium	Hexavalent Chromium	Hexavalent Chromium
	Daily Max	Monthly Avg.	Daily Max	Monthly Avg.	Daily Max	Monthly Avg.
BAT limits	26.2	6.3	**21.3**	**7.4**	**1.4**	**0.7**
BPT limits	**12.5**	**6.1**	25.4	14.9	2.02	0.95

In accordance with the "Guide for the Application of Effluent Limitation Guidelines for the Petroleum Refining Industry" dated June 1985 and published by the USEPA, calculated BPT limitations for these three parameters shall be compared to the calculated BAT limitations for these parameters, and the more stringent of the two should be imposed in the permit.

The applicable effluent limitations shown in bold in the above table are the applicable refinery only effluent limitations that will be added to the OCPSF and BPJ calculations to derive a total effluent limitation applicable at DSN 002A.

4. Contaminated Stormwater Adjustment (Refining Guidelines):

The USEPA Petroleum Refining Point Source Category ELGs and Standards (Refining Guidelines), 40 CFR Part 419.22 (e), provide for permittees to receive an additional allocation for treating contaminated stormwater for BOD5, TOC, TSS, Oil and Grease, Phenolic Compounds, Total Chromium and Hexavalent Chromium prior to discharge to a surface waterbody. As the ELG's only establish credit for treated stormwater discharges, the permittee must route any stormwater through the treatment plant, and subsequently discharge it through outfall DSN 002A, to be eligible for this credit. The additional allocation is incorporated by using equations to calculate the reported mass discharge values considering the contribution of contaminants from the stormwater. Therefore, the permittee's discharge limits for these parameters at DSN 002A are always the same; however, credit for stormwater is applied when the permittee calculates its individual discharge amount for each parameter on its DMR. The permittee is required to monitor the stormwater flow and report this value on its monthly DMRs under the "Flow, In Conduit or thru Treatment Plant" parameter for DSN 002A where the Sample Point is specified as "Precipitation". In the event that there is no stormwater flow routed through the treatment plant, a credit does not apply. The former permittee, Exxon, developed and the Department accepted a comprehensive computer program to calculate stormwater flow rates on a daily basis.

Details of the program are included in Exxon's letter to the Department, dated December 1, 1986 and the Department's acceptance letter of February 23, 1987, addressed to Mr. M. L. Manewitz of Exxon.

The allocation is calculated by using the following formula:

Mass Load For Pollutants (kg/d) =

(Stormwater Flow, kgal/day) from DSN 002A x (Effluent Limit Factor for Pollutant, lb/kgal) / 2.2 lbs/kg

The effluent limit factors from 40 CFR 419.23 are summarized below:

BAT effluent limitations for contaminated runoff		
Pollutant	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	English units (pounds per 1,000 gallons of flow)	English units (pounds per 1,000 gallons of flow)
BOD5	0.40	0.22
TSS	0.28	0.18
TOC	0.88	0.48
Oil and Grease	0.13	0.067
Phenolic compounds (4AAP)	0.0029	0.0014
Total chromium	0.0050	0.0018
Hexavalent chromium	0.00052	0.00023

After calculating the loading allocation value and reporting such on the DMR for DSN 002A under "Calculated Adjustment", the permittee shall subtract this loading allocation due to stormwater from the actual gross loading leaving the treatment plant that is reported on the DMR for DSN 002A under "Effluent Gross Value". This value will represent the calculated process wastewater loadings and shall be reported on the DMR form for DSN 002A under the sampling location of "Effluent Adjusted Value".

Section 2: 40 CFR Part 414.91 OCPSF Guidelines (7/1/96 Edition): Subpart I-Direct Discharge Point Sources that Use End-of-Pipe Biological Treatment

Chemical Plant (CP) Subparts and Production:

Subpart	Metric Tons (MeTons)	% of Production
D. Thermoplastic Resins	124,571	32
G. Bulk Organic Chemicals	13,432	3.0
H. Specialty Organic Chemicals	254,639	65
E. Thermosetting Resins	0	0
B. Rayon Fibers	0	0
C. Other Fibers	0	0
Totals	392,642	100

A. Calculation of CP Allocations to Effluent Limitations

There are four parts to the calculations, using the BAT approach to applying the OCPSF Guidelines:

1. Calculation of BOD5, TSS, and TOC mass limits using BAT methods based on production.
2. Calculation of Ammonia mass limits using Best Professional Judgement (BPJ).
3. Calculation of Oil and Grease mass limits using BPJ.
4. Calculation of 40CFR 414.91 toxic pollutants mass limits for 56 organic priority pollutants, 5 metals, and cyanide.

B. Flow Rates Used in OCPSF Mass Limit Calculations:

Following are the maximum monthly average flows over the most recent year (May 2011- April 2012)

Wastewater Treatment Plant (WWTP): 11.5 MGD

West Side Chemical Plant (WSCP) = 0.81 MGD
Linden Technology Center (LTC) = 0.27 MGD
Total Chemical Plant = 1.08
Sulfur Acid Regen. Units = 0.08

Refinery Flow: 11.5 - 1.08 = 10.42 MGD

C. Calculation Details:

1. BOD5, TSS, TOC Mass Limits: CP calculations of BOD5 and TSS allowances are based on "production proportioned" concentrations in 40 CFR, Sections 414.41, 414.61, 414.71, and 414.81. TOC mass limits are 2.2 X BOD5 limits.

Subpart	Most Recent % Production	Effluent Limit Factors			
		BOD5 (mg/L)		TSS (mg/L)	
		Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.
D: Thermoplastic Resins (414.41)	32	64	24	130	40
H: Specialty Chemicals (414.81)	65	120	45	183	57
G: Bulk Organic (414.71)	3.0	92	34	159	49
F: Commodity Organics (414.61)	0	80	30	149	46
E: Thermosetting Resins	0	153	61	216	67
B: Rayon fibers	0	64	24	130	40
C: Other Fibers	0	48	18	115	36

BOD5 Daily Maximum

(0.32 x 64) + (0.65 x 120) + (0.03 x 92) + (0.00 x 0.80) + (0.00 x 153) + (0.00 x 64) + (0.00 x 48) = 101.24 mg/L
OCPSF Allowance = (1.08 MGD x 101.24 mg/L x 3.785 L/gallons) = **413.8 kg/day**

BOD5 Monthly Average

(0.32 x 24) + (0.65 x 45) + (0.03 x 34) + (0.00 x 0.80) + (0.00 x 61) + (0.00 x 24) + (0.00 x 18) = 38.0 mg/L
OCPSF Allowance = (1.08 MGD x 38.0 mg/L x 3.785L/gallons) = **155.3 kg/day**

TSS Daily Maximum

(0.32 x 130) + (0.65 x 183) + (0.03 x 159) + (0.00 x 0.80) + (0.00 x 216) + (0.00 x 130) + (0.00 x 115) = 165.3 mg/L
OCPSF Allowance = (1.08 MGD x 165.3 mg/L x 3.785L/gallons) = **675.7 kg/day**

TSS Monthly Average

(0.32 x 40) + (0.65 x 57) + (0.03 x 49) + (0.00 x 0.80) + (0.00 x 67) + (0.00 x 40) + (0.00 x 36) = 51.3 mg/L
OCPSF Allowance = (1.08 MGD x 51.3 mg/L x 3.785L/gallons) = **209.7 kg/day**

TOC

Daily Maximum = (BOD5 Daily Max.) x 2.2 =
413.8 kg/day x 2.2 = **910.36 kg/day**
Monthly Average = (BOD5 Daily Avg.) x 2.2 =
155.3 kg/day x 2.2 = **341.7 kg/day**

2. Ammonia Mass Limits: The ammonia mass limits calculated in accordance with 40 CFR 419.22, 23 and 24 are adjusted to account for the WSCP contribution. Ammonia data is collected at the WSCP influent to the WWTP and at the combined WSCP and refinery influent to the WWTP. The resulting ammonia increase due to the WSCP is 3.5% (per the following calculations). Thus, the total allocations should be increased by 3.5%.

   Total Ammonia in combined feed: 2,850 lbs/day or 1,295 kg/day
   WSCP Ammonia alone: 100 lbs/day or 45 kg/day
   Refinery Ammonia: 2,750 lbs/day or 1,250 kg/day

   Percent increase in refinery ammonia due to WSCP: (45/1,295) x 100 = 3.5%

   Ammonia Mass Adjustment:
   Daily Max. = 0.035 x 1,116 kg/day = 39.06 kg/day
   Monthly Avg. = 0.035 x 507 kg/day = 17.7 kg/day

   Final Ammonia Mass Limits:
   Daily Max. = 1,116 kg/day + 39.06 kg/day = **1,155 kg/day**
   Monthly Avg. = 507 kg/day + 17.7 kg/day = **525 kg/day**

3. Oil and Grease (O&G) Mass Limits: BPJ was used to calculate BAT mass limits for O&G based on flow proration of WSCP vs. refinery flow, as shown in the following calculation.

Total WWTP Flow (Max, Monthly Avg.) =	11.5 MGD
CP Flow (Max Monthly Avg.) =	1.08 MGD (includes LTC)
Sulfur Acid Regen. Units =	0.08 MGD
Refinery Flow: 11.5 - 1.08 =	10.42 MGD
Flow Ratio = (WSCP + LTC) / Refinery = 1.08 MGD / 10.42 MGD =	0.10

   O&G Mass Adjustment:
   Daily Max. = 0.10 x 507 kg/day = 50.7 kg/day
   Monthly Avg. = 0.10 x 271 = 27.1 kg/day

   Final O&G Limitations:
   Daily Max. = 507 kg/day + 50.7 kg/day = 558 kg/day
   Monthly Avg. = 271 kg/day + 27.1 kg/day = 298 kg/day

4. Phenolics/Phenol/ Cresol Compounds: OCPSF provides calculations for mass limits for eight individual Phenolic compounds. The concentrations for these eight are totaled and multiplied by the CP flow to obtain a mass limit. These mass limits are then added to the refinery mass limits to obtain an integrated mass limit for Refining and CP.

   Effluent Limit Factor (ug/L) x Flow Rate (MGD) x 3.785 x 0.001 mg/ug = Effluent Limit (kg/day)

Effluent Limit Factor (ug/L)		Flow Rate (MGD)		Effluent Limitation (kg/day)	
Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.
865	365	1.08	1.08	**3.5**	**1.5**

5. Metals/Cyanide: Intake water offsets (i.e., netting) for metals are allowed in reporting effluent metals loadings. The following calculation equation was used to perform the OCPFS Calculations found on the following page:

OCPFS Concentration Limit (ug/L) x CP Flow (MGD) x 3.785 l/gal x 0.001 mg/ug = kg/day

Total Chromium: Total Chromium is on both the Refining ELG and the OCPSF ELG for mass limitations. Thus, the mass limitations from the refinery calculations are added together with the OCPSF calculations found in the below table. The OCPSF calculations were calculated based on the CP total flow rate of 1.08 MGD.

Total Copper, Total Lead, Total Nickel, and Total Zinc: The total mass limitations equal the sum of the OCPFS 414.91 concentrations applied to the metal-bearing CP wastewater flow of 10.42 MGD, plus an allowance for the Net-Refinery Flow Rate (incidental sources) of 0.08 MGD multiplied by the 10/18/90 preamble to the Proposed Rule Concentrations (not applied to Total Chromium because it is covered separately by the Refining Guidelines.

Total Cyanide: Mass limitations are calculated using the CP flow of 1.08 MGD and the 40 CFR 414.91 concentrations. Since cyanide is also generated in the petroleum refining process operations, BPJ is the used to calculate an incidental mass allowance using the average value of feed to the WWTP of 130 ug/L and the Refinery flow of 10.42 MGD.

Combined Effluent Limit (kg/day) = (OCPFS ELG Concentration (ug/L) x Flow (MGD) x 3.785 x 0.001mg/ug) + (Proposed Rule Concentrations (ug/L) x Refinery Flow (MGD) x 3.785 x 0.001mg/ug)

REFINERY/OCPFS – BAT Toxic Metals/Cyanide Effluent Limitations

Priority Pollutant	Concentration (ug/L)		Flow (MGD)		Limits	kg/day
	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.
Total Cr	2,770 (O)	1,110 (O)	1.08	1.08	11.3	4.5
Total Cu	3,380 (O)	1,450 (O)	1.08	1.08	13.8	5.9
	23 (I)	23 (I)	10.42	10.42	0.9	0.9
Subtotal =					**14.7**	**6.8**
Total Pb	690 (O)	320 (O)	1.08	1.08	2.8	1.3
	114 (I)	114 (I)	10.42	10.42	4.5	4.5
Subtotal =					**7.3**	**5.8**
Total Ni	3,960 (O)	1,690 (O)	1.08	1.08	16.2	6.9
	258 (I)	258 (I)	10.42	10.42	10.2	10.2
Subtotal =					**26.4**	**17.1**
Total Zn	2,610 (O)	1,050 (O)	1.08	1.08	10.7	4.3
	57 (I)	57 (I)	10.42	10.42	2.2	2.2
Subtotal =					**12.9**	**6.5**
Total Cn	1,200 (O)	420 (O)	1.08	1.08	4.9	1.7
	130 (M)	130 (M)	10.42	10.42	5.1	5.1
Subtotal =					**10.0**	**6.8**

Referances:
(O) OCPSF 40 CFR 414
(I) Incidental metal sources (refinery flow)
(M) Measured in WWTP influent

6. Priority Pollutant Organics: BPJ was used to calculate mass limits for the 56 Organics Priority Pollutant compounds in the OCPSF guidelines. Since the Refinery Wastewater will contain at least some of the same compounds as the CP wastewater, the OCPFS 40 CFR 414.91 effluent factors are applied to the entire WWTP flow. Following is an example calculation, with the mass limits for all 56 compounds shown in Table PPO.

Example Calculation:

Acenaphthene: Daily Max. Effluent Limit

(59 ug/L) x (11.5 MGD) x (3.785 l/gal.) x (0.001 mg/ug) = 2.6 kg/day

OCPSF - BAT TOXIC POLLUTANT EFFLUENT LIMITS (DSN 002A only)

Parameter	ELG (ug/L) Daily Max	ELG (ug/L) Month Avg.	Process Flow (MGD)	Calculated Limit (kg/D) Daily Max	Calculated Limit (kg/D) Monthly Avg.
Acenaphthene	59	22	11.5	**2.6**	**1.0**
Acenaphthylene	59	22	11.5	**2.6**	**1.0**
Acrylonitrile	242	96	11.5	**10.5**	**4.2**
Anthracene	59	22	11.5	**2.6**	**1.0**
Benzene	136	37	11.5	**5.9**	**1.6**
Benzo(a)anthracene	59	22	11.5	**2.6**	**1.0**
3,4-Benzofluoranthene	61	23	11.5	**2.7**	**1.0**
Benzo(k)fluoranthene	59	22	11.5	**2.6**	**1.0**
Benzo(a)pyrene	61	23	11.5	**2.7**	**1.0**
Bis(2-ethylhexyl)phthalate	279	103	11.5	**12.1**	**4.5**
Carbon Tetrachloride	38	18	11.5	**1.7**	**0.8**
Chlorobenzene	28	15	11.5	**1.2**	**0.7**
Chloroethane	268	104	11.5	**11.7**	**4.5**
Chloroform	46	21	11.5	**2.0**	**0.9**
2-Chlorophenol	98	31	11.5	**4.3**	**1.3**
Chrysene	59	22	11.5	**2.6**	**1.0**
Di-n-butyl phthalate	57	27	11.5	**2.5**	**1.2**
1,2-Dichlorobenzene	163	77	11.5	**7.1**	**3.4**
1,3-Dichlorobenzene	44	31	11.5	**1.9**	**1.3**
1,4-Dichlorobenzene	28	15	11.5	**1.2**	**0.7**
1,1-Dichloroethane	59	22	11.5	**2.6**	**1.0**
1,2-Dichloroethane	211	68	11.5	**9.2**	**3.0**
1,1-Dichloroethylene	25	16	11.5	**1.1**	**0.7**
1,2-trans-Dichloroethylene	54	21	11.5	**2.4**	**0.9**
2,4-Dichlorophenol	112	39	11.5	**4.9**	**1.7**
1,2-Dichloropropane	230	153	11.5	**10.0**	**6.7**
1,3-Dichloropropylene	44	29	11.5	**1.9**	**1.3**
Diethyl phthalate	203	81	11.5	**8.8**	**3.5**

Parameter	ELG (ug/L)		Process Flow (MGD)	Calculated Limit (kg/D)	
	Daily Max	Month Avg.		Daily Max	Monthly Avg.
2,4-Dimethylphenol	36	18	11.5	**1.6**	**0.8**
Dimethyl phthalate	47	19	11.5	**2.0**	**0.8**
4,6-Dinitro-o-cresol	277	78	11.5	**12.1**	**3.4**
2,4-Dinitrophenol	123	71	11.5	**5.4**	**3.1**
2,4-Dinitrotoluene	285	113	11.5	**12.4**	**4.9**
2,6-Dinitrotoluene	641	255	11.5	**27.9**	**11.1**
Ethylbenzene	108	32	11.5	**4.7**	**1.4**
Fluoranthene	68	25	11.5	**3.0**	**1.1**
Fluorene	59	22	11.5	**2.6**	**1.0**
Hexachlorobenzene	28	15	11.5	**1.2**	**0.7**
Hexachlorobutadiene	49	20	11.5	**2.1**	**0.9**
Hexachloroethane	54	21	11.5	**2.4**	**0.9**
Methyl Chloride	190	86	11.5	**8.3**	**3.7**
Methylene Chloride	89	40	11.5	**3.9**	**1.7**
Naphthalene	59	22	11.5	**2.6**	**1.0**
Nitrobenzene	68	27	11.5	**3.0**	**1.2**
2-Nitrophenol	69	41	11.5	**3.0**	**1.8**
4-Nitrophenol	124	72	11.5	**5.4**	**3.1**
Phenanthrene	59	22	11.5	**2.6**	**1.0**
Phenol	26	15	11.5	**1.1**	**0.7**
Pyrene	67	25	11.5	**2.9**	**1.1**
Tetrachloroethylene	56	22	11.5	**2.4**	**1.0**
Toluene	80	26	11.5	**3.5**	**1.1**
Total Chromium	2,770	1,110	11.5	**120.6**	**48.3**
Total Copper	3,380	1,450	11.5	**147.1**	**63.1**
Total Cyanide	1,200	420	11.5	**52.2**	**18.3**
Total Lead	690	320	11.5	**30.0**	**13.9**
Total Nickel	3,980	1,690	11.5	**173.2**	**73.6**
Total Zinc	2,610	1,050	11.5	**113.6**	**45.7**
1,2,4-Trichlorobenzene	140	68	11.5	**6.1**	**3.0**
1,1,1-Trichloroethane	54	21	11.5	**2.4**	**0.9**
1,1,2-Trichloroethane	54	21	11.5	**2.4**	**0.9**
Trichloroethylene	54	21	11.5	**2.4**	**0.9**
Vinyl Chloride	268	104	11.5	**11.7**	**4.5**

Section 3: Combination of Effluent Limits using Refining Guidelines and OCPSF Guidelines

This section summarizes the results of the Refining, OCPSF, and BPJ Calculations in table format.

BPT and BAT Effluent Limitations for Conventionals, Non-Conventionals, Metals, and Cyanide

	BPT and BAT Effluent Limitations – Refinery Only (kg/day)		BAT Effluent Limitations – Chemical Plant Only (kg/day)		Combined (refinery + CP) BAT Effluent Limitations (kg/day)	
Pollutant Parameter	**Daily Max.**	**Monthly Avg.**	**Daily Max.**	**Monthly Avg.**	**Daily Max.**	**Monthly Avg.**
Conventional Parameters						
BOD5	1,674	930	413.8	155.3	2,088	1,085
TSS	1,167	744	675.7	209.7	1,843	954
O/G	507	271	50.7	27.1	558	298
NH_3-N	1,116	507	39.06	17.7	1,155	525
Sulfide	11	4.9	--	--	11	4.9
TOC	3,686.2	2,046	910.3	341.7	4,597	2,388
Non-Conventional						
Phenolics *	12.5	6.1	3.5	1.5	16	7.6
Total Cr. *	21.3	7.4	11.3	4.5	32.6	11.9
Hex. Cr. *	1.4	0.7	--	--	1.4	0.7

*** The most stringent of BPT or BAT was used for refinery only limitations**

Metals/Cyanide						
Total Cu.	0.9	0.9	13.8	5.9	14.7	6.8
Total Pb.	4.5	4.5	2.8	1.3	7.3	5.8
Total Cn	5.1	5.1	4.9	1.7	10.0	6.8
Total Ni.	10.2	10.2	16.2	6.9	26.4	17.1
Tot Zn.	2.2	2.2	10.7	4.3	12.9	6.5